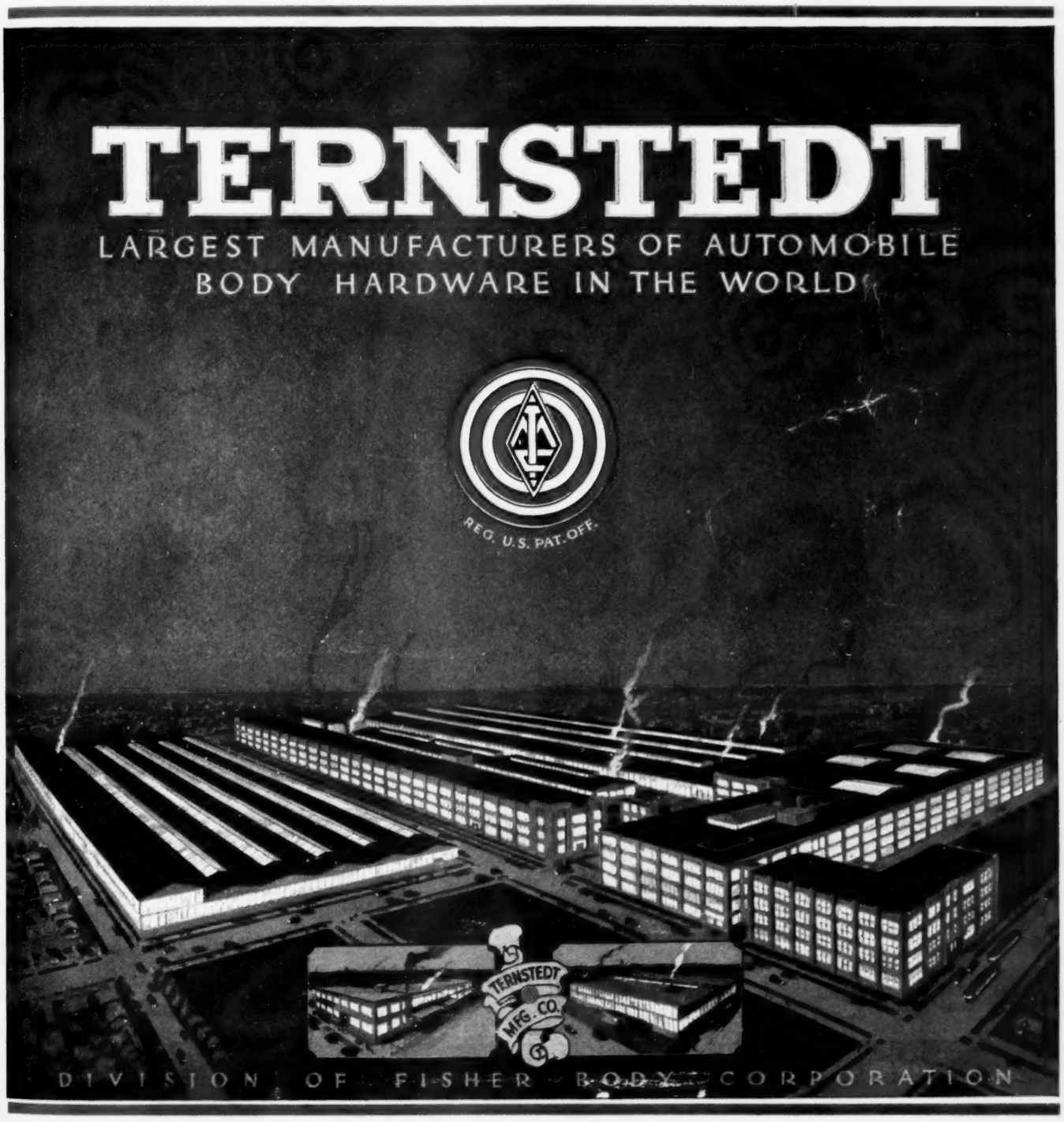
JUN 2 - 1923

AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

Vol. XLVIII
Number 23

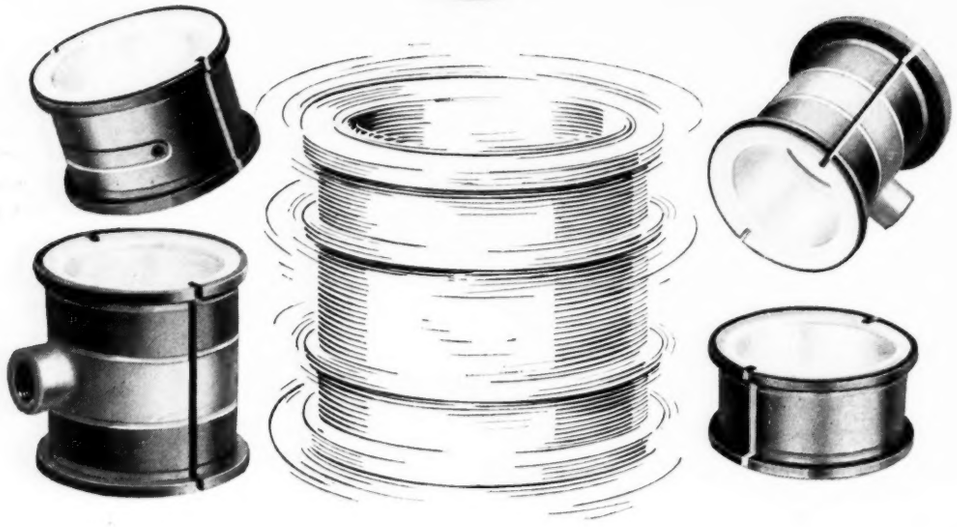
PUBLISHED WEEKLY AT 239 WEST 39th STREET
NEW YORK, JUNE 7, 1923

Thirty-five cents a copy
Three dollars a year



Entered as second-class matter Jan. 2, 1903, at the post office at New York, N. Y., under Act of March 3, 1879.

FEDERAL BEARINGS



Federal Bearings Are Often Said to Be "The Finest Made"— and We Can, and Do — Guarantee Their Uniformity

MEN rate a product according to their own respect for quality. The man who is critical of himself and of his work or product —he is the man who respects quality in another man's product.

That is the reason prominent automobile, truck and motor manufacturers speak so highly of Federal Bearings.

They quickly and surely discern the genuine quality of Federal Bearings—and their high opinion of these bearings is formed as a result of practical knowledge and experience, not merely accepted as the result of a clever "sales" talk.

In a strict sense Federal Bearings are not "sold" to these men—because they *buy* them.

But this we can do—we can, and do—guarantee that Federal quality is standard. That *all* Federal Bearings are alike — one bearing with another and each bearing throughout its entire structure.

Federal Bearings are lined by a patented Centrifugal Force Process. The process is automatic and unvarying—and so the quality is unvarying.

Federal Bearings will bring to your motor that perfection and durability which you and your customers like to see. Our engineers are at your disposal with reference to your bearing requirements.

FEDERAL BEARING & BUSHING CORPORATION

BABBITT-LINED BRONZE-BACK BEARINGS_BRONZE BUSHINGS_BRONZE CASTINGS

DETROIT — MICHIGAN

AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

VOL. XLVIII NEW YORK—THURSDAY, JUNE 7, 1923 No. 23

Economics Rather Than Weather Govern Automobile Sales

Too much reliance is placed by industry on theory of seasonal fluctuations. Motor car production curve follows closely that of general business. Customs of trade result in slowing up at certain seasons. Output chart provides illuminating facts.

By James Dalton

EVIDENCE is accumulating that the sale of passenger automobiles is governed vastly more by economic than by seasonal conditions.

It seems to have become a tradition in the industry that sales must fall off at certain periods of the year, and every time there is a decline in business it is hailed as "seasonal." This may have been true in the earlier days before the advent of the closed car in large numbers, but its usefulness as a basis for calculating production schedules is passing rapidly.

There have been no sharp ups and downs in production and sales since the armistice in November, 1918, which are not easily accounted for by general business conditions.

The closed car naturally has been an important factor in making the use of the automobile more nearly uniform in all seasons and in all sections of the country. In 1917 the number of closed cars produced constituted only 3½ per cent of the total. It had reached 7 per cent by the beginning of 1918 and rose 3 per cent in that year. It had climbed to 35 per cent by the end of 1922, and the curve is still rising sharply.

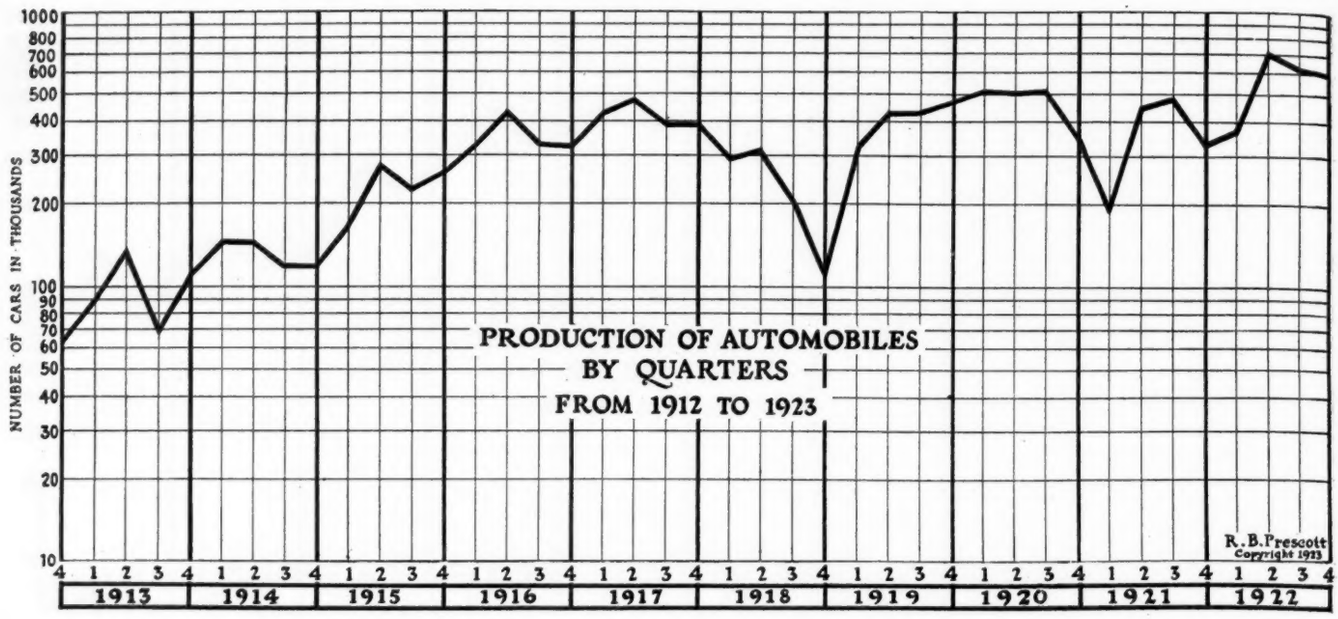
Spring dating in the tire field was based on the seasonal theory, and that branch of the industry still clings to it long after it has ceased to be of practical value. There is nothing remotely resembling spring dating in the vehicle manufacturing field, but automobile makers still seem to think there are certain months when business just naturally slips.

July and August often are mentioned as months of a seasonal decline in sales, but August was the second biggest month in 1922 and the biggest in 1921. July was the fourth biggest month last year and the second biggest in 1922. Accurate monthly production figures for the other years since 1918 are not available.

Notwithstanding these facts, almost the entire industry began to talk more than six months ago about the probability of a "seasonal decline" beginning with July. Sales naturally fell off in the largest cities in those months because so many potential purchasers of motor cars have gone away on vacations, but there are myriads of other places where they are among the best buying months, to say nothing of the farmers who have begun to turn their crops into cash and are in a purchasing mood in midsummer.

BACK in the days when only the wealthiest could afford to drive closed cars, it was quite logical that there should be a very sharp falling off in sales in the winter months because of weather conditions. It remains true, to a considerably smaller degree, in the country districts and small towns of the northern States where no attempt is made to remove accumulations of snow from the streets. Snow removal work is becoming more general every winter, however.

Whatever falling off in sales may result from adverse weather conditions in these sections can be counter-balanced by larger sales of closed cars in cities and towns where roads and streets are kept usable.



The automobile business now has become a year-round institution. When bad weather really does cause a decline in some places intensive sales work at other points will make up the losses. Closed cars, when enough of them can be made to meet the demand, will come close to stabilizing sales at the same level month in and month out when economic conditions remain the same.

Economic conditions rather than the weather have caused most of the ups and downs in the automotive field since the armistice, although it must be conceded that general business conditions are influenced to a considerable extent by seasonal trade demands. A good many other industries suffer more in this respect than does the automotive trade. Farmers and building workers are busiest in summer; industrial workers in the winter. When the nation is prosperous, however, that prosperity is pretty evenly distributed.

Production Follows Business Trend

From early in 1917 up to the day of the armistice in November, 1918, the entire country was working at feverish speed to make munitions. Motor vehicles were being produced chiefly for the army and many automotive plants were being used for war purposes. For these reasons the automobile production curve went steadily downward from July 1, 1917, until the cannons ceased their blare in Europe.

Suddenly the nation was called upon to reverse gears and get from a war to a peace basis. This resulted in much uncertainty and an andless amount of readjustment, with consequent unemployment. This continued for about two months.

Business began to strike its gait in January, 1919. This was the start of the unprecedented wave of prosperity which continued until July, 1920. The automobile production curve followed the trend of business. By April 1 it was back where it had been the preceding July 1. At the end of December it had reached the peak previously recorded in June of 1917. Business generally was extraordinarily good the entire year of 1919 and there were no "seasonal" declines in the sale of automobiles.

From July 1, 1919, until Oct. 1, 1920, there was at no time a variation of more than 21 per cent in the production of automobiles. As a matter of fact, to have kept in line with general business the motor car output curve should have begun declining six months earlier than it did. Manufacturers did not seem to think it possible retail sales could be falling off as their dealers assured them they were as early as April of that year. In consequence there was a heavy overproduction. When they finally did make up their minds that prosperity had been given a terrific wallop, they had enough cars on hand to meet the demand for six months with very little additional output.

General business grew steadily worse until April, 1921, and then it began to recover somewhat. Automobile production went up sharply for the next three months and a little less sharply for the following quarter. Then there was a secondary economic reaction and the curve of output was down by January, 1922, to where it had been the preceding May.

Then started the long swing recovery of trade and industry throughout the country and automobile output more than kept pace. Production rose from 90,000 in January to 289,000 in June. It was 245,000 in July and 273,000 in August. Output for the last quarter, when there should have been a "seasonal decline," according to accepted theory, was: October, 238,000; November, 235,000; December, 226,000. December production was 8000 greater than that of April, always considered one of the biggest months of the year. But general business was better in December than it was in April although the weather was much worse.

The tide of prosperity surged forward through the first four months of the present year and again the demand for motor cars kept pace with it. Then building operations were curtailed and business in general slowed up a bit around May 1. Running true to form, the automotive industry slowed up a bit also.

Falling Off in Sales Not Seasonal

In some quarters the slight falling off in sales is being referred to as "seasonal." The only May since 1912 when the production curve was not mounting upward was in 1918. Any slowing up this month, therefore, cannot be classed as seasonal. As a matter of fact, if weather were exerting any real influence on the situation, the backward spring should have made May a bigger month than April.

The widest variation in quarterly production in any single year was in 1920, when there was a difference of about 42 per cent between the smallest three months and the biggest.

It undoubtedly is true that there is not so much motor-

ing in winter as in summer, but December of 1922 was a bigger month than either September or April. Many of the fluctuations which have been regarded as seasonal in years prior to 1918 could have been explained by economic conditions, but the eyes of the industry apparently were turned on the weather rather than business as a barometer of sales.

Two months of the year in which seasonable sales disturbances seem to be expected are August and December. But it must be conceded that customs of the industry have considerable to do with business in those months.

New models begin to make their appearance in August usually, and motor-wise prospects are inclined to wait until the newest styles appear. They continue coming out for three months. More new models appear at the shows in January and price changes frequently are made at that time. It is perfectly logical, therefore, that persons who have waited until those months before buying should defer their purchases until after the national expositions.

So long as these trade practices prevail and until the use of closed cars becomes more nearly universal, it is quite likely that the sales curve of motor cars will bend downward a little at these periods, but there is no reason why the depressions should be deep, providing general business conditions are good.

Study of the production curve since 1912 discloses that there were rather sharp sales declines in the third quarter, when most of the new models were appearing, in 1913, 1914, 1915, 1916, 1917 and 1918. From the end of the second quarter until the end of the third output ran along on practically an even keel in 1919 and 1920. It went up a little in the third quarter of 1921 and declined a little in the same period in 1922.

The production curve for the fourth quarter in relation to the third quarter of each year since 1912 follows: 1913, up; 1914, even; 1915, up; 1916, even; 1917, even; 1918, off; 1919, up; 1920, off; 1921, off; 1922, about even.

It would seem fair to assume, therefore, that a desire on the part of prospects to supply themselves with new models had more effect on sales than winter weather.

Internal Pressure Oiling Reduces Fan Noise and Wear

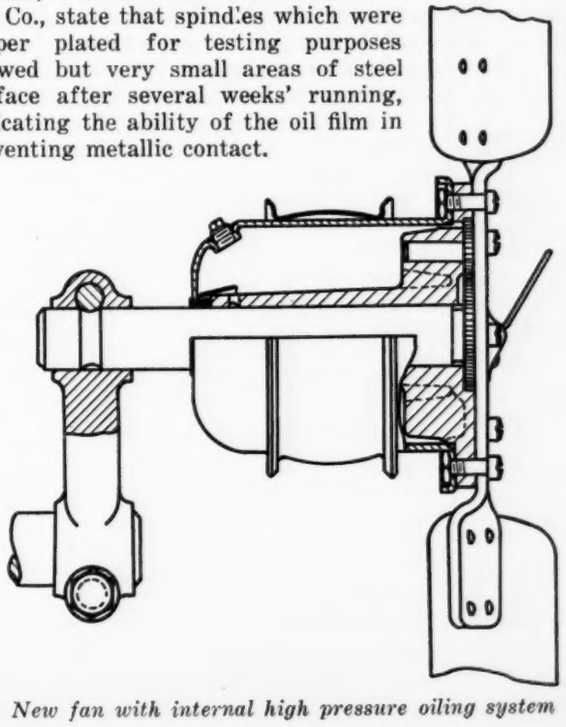
NOISY operation and bearing wear are reduced to a minimum by means of an internal high pressure oiling system in an automotive fan recently developed. The fan spindle is made of soft steel and has a fine pitch gear cut on the circumference of its head which meshes with an idler pinion. The latter is carried in the flanged cast iron fan hub. This combination, enclosed in an accurately machined chamber in the fan mounting flange, forms an oil pump, the sole outlet of which is through the fan bearing. The normal end thrust of the fan is also taken on surfaces which are within the pump compartment and are therefore lubricated under high pressure.

A cast iron flanged hub is the chief member of a relatively simple assembly, as it carries the usual fan spider on its forward face, provides the pump chamber within its flange, carries the pressed steel oil compartment and belt pulley on the rear face of its flange and finally forms the fan bearing. The fan spider, in connection with a gasket, forms the pump cover or enclosure. The bolts which retain the fan spider extend through the hub flange and secure the pressed steel cup which forms the oil chamber. The flange of this cup is beaded to form a stiff face which, with an intermediate gasket, prevents oil leakage resulting from high rotating speeds. The flanged drive pulley is also made of pressed steel and is secured to the oil chamber by spot welding. A small filler plug is placed near the rear end of the oil chamber.

Reference to the cut will readily explain the operation of the fan. As the belt rotates the fan, any oil within the oil chamber will be thrown to the outer wall by centrifugal force. As the cup is somewhat larger at the forward end, the oil will naturally accumulate there. A small hole is drilled through the hub flange, from a joint just inside of the oil chamber shell, into the outer edge of the idler gear compartment, permitting the flow of oil into the spaces between the teeth of the idler gear. As the hub rotates, the idler gear revolves around the gear which is cut on the head of the fan spindle, forcing the oil out before the point of mesh of the two gears. A milled slot at this position carries the oil to the forward end of the bearing bore where the spindle has been relieved to permit equal distribution around the entire bearing.

The oil at a pressure of more than fifty pounds then forces its way along the length of the bearing. Near the rear end of the hub, a groove is turned in the cast iron bearing and relief holes are drilled at this point to return the oil to the oil chamber. Due to its rotation, this relief groove acts as a centrifugal pump in removing oil from the space between the spindle and hub. The short extension of the hub back of the relief groove performs a function similar to the packing nuts in the usual pump. A small wire ring is mounted snugly on the spindle between the rear end of the hub and the back of the oil chamber shell. This ring serves to break the oil film on the spindle at this point and in conjunction with a conical slinger which is pressed in the back of the oil chamber throws any seepage out into the oil compartment. The conical slinger fits closely to the spindle and with the other provisions which have been described, makes the fan hub oil tight.

The cast iron surface is burnished to a glazed finish which is very durable and has excellent characteristics as a bearing. In this assembly, that ability is utilized and the high pressure oil film prolongs working life and greatly reduces noises by preventing metal to metal contact. The makers, the Automotive Fan & Bearing Co., state that spindles which were copper plated for testing purposes showed but very small areas of steel surface after several weeks' running, indicating the ability of the oil film in preventing metallic contact.



New fan with internal high pressure oiling system

Make the Tire Business Profitable for the Dealer

Retail merchant is a real selling force, not merely a channel of distribution. Policies likely to cut his profits are not beneficial to manufacturer in long run. Inflated list prices, special brands, direct sales to fleet owners are in this class.

By Norman G. Shidle

PRICE-CUTTING in the retail field is responsible for many merchandising troubles in the tire industry. It has destroyed public confidence in tire values, made stabilization of production difficult, and kept many good retailers out of the tire business. Sure of a profit on other parts and accessory lines, the legitimate automotive dealer has hesitated to handle tires because certain merchandising customs subject him to cut-rate competition on every hand.

Tire selling must be made attractive to merchants who are in business on a permanent basis; to men who are good credit risks, who are well thought of in their community, and who can restore public confidence in tire selling methods.

These stable, firmly financed retailers can make the tire business a better business. Many men of this type are already handling tires, and it is through them that the real profits are coming to manufacturers. But such men are interested only in products on which they are assured of a fair profit, reasonable territorial protection, and a minimum of cut-throat competition. More of them can be attracted to tire selling and kept in it if manufacturers will eliminate those trade practices which encourage price-cutting and which take from the retailer many of his opportunities for legitimate profit.

Merchandising methods which fall in this undesirable group include the following:

1. Inflated list prices;
2. Special brands;
3. Direct sales to commercial accounts;
4. Excessive numbers of dealers in given areas.

Tire manufacturers can give much constructive assistance to dealers in the way of advertising helps, cooperation in connection with the standard warranty and so forth, but elimination of those policies which demoralize retail trade are of the greatest immediate importance.

THE dealer is the most important factor in tire merchandising today. Many sales practices now common in the tire industry tend to demoralize the retail market and to take away from the dealer opportunities for fair profit.

Manufacturers should discontinue these methods. Some of the things the industry would be better off without are:

Inflated list prices.
Special brands.
Direct factory sales to commercial accounts.
Excessive number of dealers in a given area.

Money spent in selling direct to fleet owners might be used more profitably to educate and help dealers. An able dealer, properly handled, is a permanent asset of tremendous value.

List Prices

List prices should be based on tire value. The custom of putting them high enough to permit the dealer to make a "consumer" discount simply helps to confirm the general idea that prices are higher than they should be and that there are enormous profits in the tire business.

The practice keeps alive general public distrust and does not really deceive anybody. Ultimately it leads the tire buyer to expect a discount from list on every tire and makes him feel that he has been "stung" if ever he does have to pay the full list price.

Elimination of inflated list prices is well within the power of the manufacturer. He gains nothing by it, while dealers of the type worth having would rather sell on a quality and value basis than with only a price appeal.

List prices should be high enough to permit the dealer to merchandise properly and realize a fair net return on each sale. Discounts in past years have been so small on some important brands that the dealer could scarcely handle them profitably. Large manufacturers have raised their discounts from about 12½ per cent in 1918 up to about 30 per cent in 1923, while the smaller tire builders usually give about 40 per cent.

Some discounts, however, run up as high as 50, 60, and 70 per cent in order to permit price cutting for competition with well-known brands. These excessive discounts are just as injurious to sound retail tire business as were the sub-normal discounts previously common among the larger manufacturers.

Special Brands

When a tire manufacturer makes special brands for individual distributors he is "biting off his nose to spite his face." The special tire sells in direct competition with the one which bears the manufacturer's name and takes away from the revenues of the dealer who is trying to sell the standard make.

Besides being unfair to the regular dealer, the sale of special brands encourages price-cutting, since the special brand is often so priced that it can be sold at retail for less than the standard. Any advantage gained through the sale of special brands is likely in the end to be more than

offset by sales lost on the standard brand and ill-will developed in the regular dealer organization.

Direct Sales to Fleet Owners

The custom of selling tires direct from the factory or factory branch or distributor to owners of car or truck fleets has removed from the dealer one of his best sources of profit. Many strong automotive merchants have given this practice as their chief reason for not handling tires. Certainly it does not indicate a desire on the part of the manufacturer to help his dealers to become substantial merchants.

Some manufacturers say that dealers are not capable of handling big business of this kind; that they let it slip through their fingers; that they cannot carry sufficient stocks to take care of it; and that they cannot provide adequate service. These statements hold true as regards some large accounts, but it is equally true that in most communities dealers could be developed to handle such business if given a margin upon which to do so.

One important tire company, as a matter of fact, has provided a differential between the prices quoted to its so-called national accounts and the prices quoted to dealers, so that the dealers can go after this business. In some instances the dealers have landed the accounts and are keeping them by rendering good service and prompt deliveries.

Manufacturers cannot expect to get maximum dealer cooperation so long as they continue to go into the dealer's territory and take away from him some of the best business available. Handling of commercial accounts by dealers may have to be developed gradually, but the substantial merchants needed in the tire business will be capable of assuming such responsibilities and will demand the opportunity to make the profits which they justly consider should be theirs.

Commercial Sales Loss to Dealer

Selling direct from branches to commercial accounts involves far more than supplying tires to company fleets of cars and trucks. The dealer loses a good many sales in that way alone, but he loses also sales of tires for personal cars of employees in these large organizations. The employee simply gets an order from his purchasing agent, goes to the nearest factory branch or distributor and gets a tire for the same price as the tire dealer in his town.

In some cases there is nothing to stop him from getting tires at this same price for many of his friends. When the actual commercial sales are added to the personal sales for individual employees and those to friends of individual employees, quite a slice is cut off the dealer's sales possibilities.

The direct-from-factory discount is not supposed to be extended to individuals in the employ of these various companies, of course, but the fact remains that it is and countless sales are made on this basis.

Progressive tire merchants have a legitimate kick against factory sales direct to fleet owners. Discontinuance of the practice would go far toward giving the dealer confidence in the manufacturer and in creating good will between manufacturers and retailers. Some companies have already taken steps along this line, and further action is desirable.

Density of Dealer Population

The number of tires sold does not vary directly with the number of dealers. A point can be reached easily where added dealers fail to produce a greater volume of profitable sales. This point actually has been reached in a number of cases.

PRICE-CUTTING demoralizes the retail tire market. Every merchandising practice that encourages or permits cut-rate selling should be eliminated.

Manufacturers are learning that one price-cutter can drive from their retail organization every good dealer in a community. Price cutters do the tire maker little good, because their efforts are not continuous. Most dealers of this kind come and go. They do not provide permanent, assured channels of distribution.

Good dealers can be attracted to the tire business and kept in it only if they are given an opportunity to make fair profits in return for honest merchandising effort.

It may not be feasible to give each dealer an exclusive territory as is common in automobile practice, but he must have reasonable protection from competition with his own brand of tire. Profits are the greatest stimulant to sales. Trying to force sales by dealer competition is one of the chief causes of price-cutting, scant profits, and costly dealer turnover.

Competition stimulates sales only to a certain extent. When a dealer in Hyphen tires finds three other merchants within a radius of two or three blocks handling the same product, he may be stimulated to greater efforts for a while. But if he finds sales and profits dropping despite that increased effort, he finally decides to stop selling these tires and takes on some line on which he can make money. This process is repeated in the case of other dealers and the resulting sales probably are no larger than they would have been if one good dealer had been permitted to work the same territory. Sales cost and dealer turnover, however, have been considerably higher.

A dealer must have enough territory in which to market a particular make of tire, if he is to sell it profitably. When this is the case, he will push sales without undue urging, as he wants the money just as badly as the tire maker does. The only time the manufacturer really has to "ride" the dealer to take more tires is when the latter is having trouble disposing of them at a profit.

Cutting Retail Distribution

The chances of selling a maximum number of tires is greater with fewer dealers, each of whom can make a profit, than with a larger number each of whom is cutting prices and resorting to any method possible to keep his head above water.

Large manufacturers are recognizing these facts and are realigning their dealers accordingly. One large company is cutting its retail representation by 50 per cent, while others are reducing them materially. The number of direct dealers in a large city was cut from 150 to 14 recently by an important company.

Along with this reduction in dealer forces has come a readjustment that involves additions to the organization in many places. Recent studies by manufacturers have shown that while they have many more dealers than they need in numerous places, the quota of retail representatives is too small in other areas. Both of these conditions are being remedied.

The tire industry in general does not seem to have recognized the importance of the dealer as a selling force. It has regarded him too much as a channel of distribution

and not enough as a real merchandising power. Methods have been used to get tires into the hands of buyers without much thought as to their effect on the tire dealer.

A clear picture has been drawn of the sales that would be lost if these various methods of selling were discontinued, but no distinct vision has been held of how many more sales might be made if the tire business were made consistently profitable for the retailer.

A leading tire executive went to the heart of the question when he said:

"The dealer is the most important element in the tire situation. He has more influence over the buyer than has the dealer for any other product. If conditions are made right for a dealer to make money, he is the biggest asset any tire company can possess."

The influence of a good dealer in his community cannot be doubted. He can make many sales simply on his own reputation for reliability and service. This has been demonstrated many times by the work of high-grade passenger car dealers who have successfully sold little-known cars in a particular community in competition with more widely known makes.

The tire business can be materialy improved by making it more attractive to the merchant who already has influence and standing in his community. The car dealer or the automotive accessory dealer who has built a solid business for himself can be interested in selling tires and can do much toward improving the retail situation. Men of this character can be brought into the tire business in large numbers if the manufacturers try to build a marketing structure with the retailer as its foundation.

The practices mentioned previously should be discontinued because they make it difficult for the retailer to get the most out of selling tires.

Tire selling must be made profitable to the retailer. When this is done the manufacturer will reap the benefit in lowered marketing cost, more profitable sales, and stabilized production.

Six-Point Carbon Range Proposed for Alloy Steels

THE Iron and Steel Division of the Society of Automotive Engineers has been asked by a metallurgist connected with one of the larger automobile producers to consider revising the present S. A. E. Iron and Steel Specifications so as to specify, among other requirements, a six-point carbon range for alloy steels.

For many years the steel producers have been controlling their product so that the carbon-content has come within the range of 10 points (0.10 per cent) specified in the present S. A. E. Iron and Steel Specifications. Closer ranges have not been attempted, as it was recognized by the users as well as by the producers that such refinements would mean an increase in the cost of the steel.

A few of the larger companies have, however, decided as a result of experience that for certain parts closer limits than those specified in the present S. A. E. Steel Standards are desirable. As they are purchasing in large quantities, it is possible for them to obtain closer limits through the use of resident inspectors at the mill. As it is impractical to use two methods of numbering steel in one plant, companies desiring steel made to closer limits have used their own specification numbers rather than the S. A. E. Specification numbers.

It has therefore been suggested that the present method of numbering S. A. E. Steels be changed to a system that would make it possible to specify any steel composition. The suggestions that have been submitted to the Iron and Steel Division for consideration are given herewith.

(1) The carbon range of 10 points for all carbon steels to remain as at present.
(2) The manganese range for all carbon steels to be 30 points
(3) The same sulphur and phosphorus limits to be specified for all carbon steels
(4) The same silicon limits to be specified for all carbon steels
(5) The carbon range for all alloy-steels to be 6 points
(6) The manganese range for all alloy-steels to be 20 points
(7) The same nickel range to be specified for all nickel, nickel-chromium or nickel-molybdenum steels
(8) The same chromium range to be specified for all chromium vanadium, nickel-chromium or chromium-molybdenum steels
(9) The same sulphur and phosphorus content to be specified for all alloy-steels
(10) The same molybdenum and vanadium ranges to be specified for all alloy-steels
(11) The adoption of a more comprehensive system of numbering

In reference to the adoption of a more comprehensive system of numbering the following system was suggested:

> The first two digits of the specification number should designate the classification of the steel as at present. The next two digits should designate the carbon-content desired, and the last two digits the manganese-content desired. S. A. E. Steel No. 103865 would then indicate a carbon steel of 0.38 per cent carbon, 10 points variation (0.33-0.43) and 0.65 per cent manganese, 30 points variation (0.50-0.80). The sulphur and phosphorus content would be standard as well as the silicon. S. A. E. Steel No. 333070 would indicate a nickel-chromium steel of standard nickel and chromium content, with carbon 0.30 per cent, 6 points variation (0.27-0.33) and manganese 0.70 per cent, 20 points variation (0.60-0.80). The sulphur and phosphorus-content would be standard as well as the silicon.

With the proposed system it would be possible to specify any grade of steel with any percentage of carbon or manganese that is desired for a given requirement. It would also be possible for all users of steel outside of the automotive industry to apply their particular analyses to the system.

CLAIMS have been advanced by officials at the Bureau of Standards that tests of automobile brake linings will save automobile users $10,000,000 or more each year. These tests consist of wearing out samples of different kinds of lining, under conditions which permit definite comparison of their useful lives.

Manufacturers are said to be much interested in the tests and have made use of the results in improving their manufacturing methods, with the result that all the standard makes have been improved by varying amounts. The resulting annual saving to users of automobiles is declared to be approximately one thousand times the entire cost of the tests.

Indianapolis Race Proves Superiority of American Design

Engines are small editions of 183 cu. in. models used last year. Radical engineering changes lacking. Superchargers are carried by Mercedes. Five-bearing crankshafts replace three-bearing type. Great uniformity in valve mechanisms.

THAT American design and workmanship are the equal of any in the world is apparent from a view of the American race cars that competed in the 1923 race on the Indianapolis brick course. The performance of the American entries entirely justifies this statement.

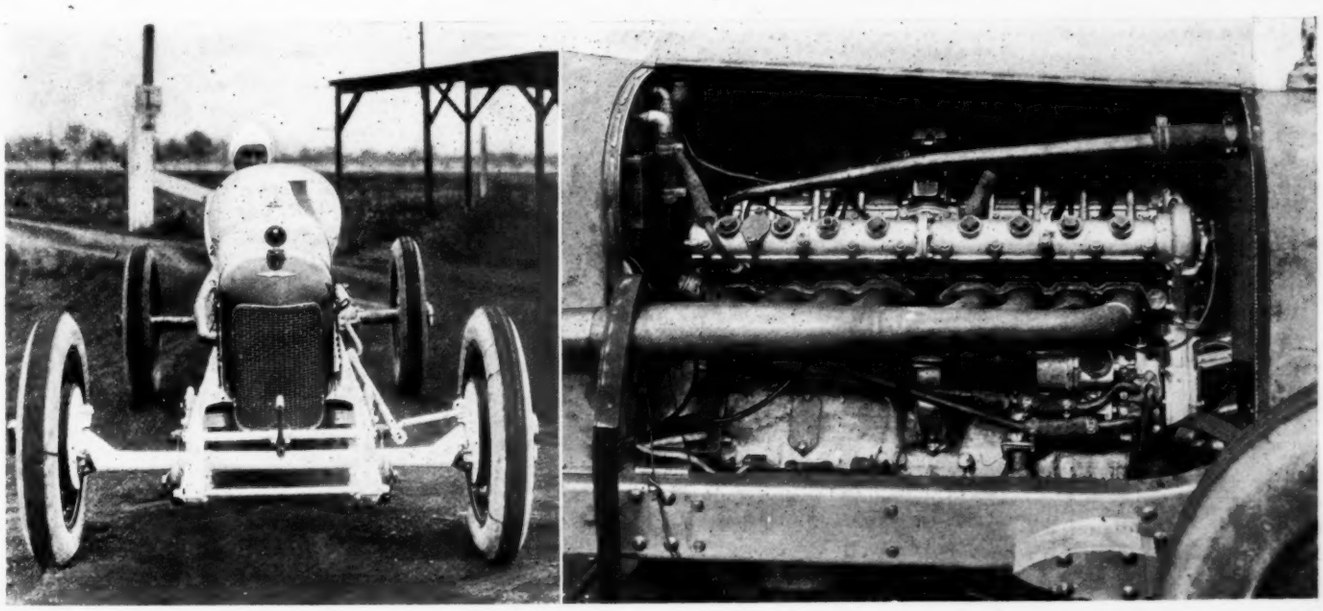
Details of construction were difficult to secure because practically all of the cars entered, except the Ford, Duesenberg and Mercedes, were undergoing changes in spring suspension up to the time of the race. These changes were made necessary by the rough surface of the Indianapolis track. One car was fitted with three separate sets of springs before the race in order to give some degree of comfort to the drivers. The extreme discomfort of driving accounts for the fact that the average time of the winner was not as fast as last year. Whether this discomfort was due to the condition of the track or the construction of these light chassis, it is impossible to say definitely.

The fact remains, however, that the qualifying trials showed the cars to be considerably faster than the 183 in. racers of last year and that the winner's average did not approach as near to his qualifying speed as did the winner's average last year. The same is true of the cars that finished second, third, fourth and fifth.

None of the cars presented anything radical in design and, as a whole, might be considered vest pocket editions of the cars of 1922. The supercharger on the Mercedes might be considered a single exception as it constituted the first use of this method of gas induction on a car in an Indianapolis race. The Mercedes company has been developing the supercharger for the past three years and has made it regular equipment on their two new stock models, the 10-40 and the 6-25, the latter being a six-cylinder job. The first appearance of the blower type of supercharger was in the Targa Florio in Sicily on three Mercedes cars driven by the factory team of Lautenschlager, Sailer and Werner, the same team that campaigned the Mercedes at Indianapolis this year.

Seventeen of the 24 cars that started carried engines having eight cylinders in line. Of the remaining seven, four were cars with four cylinder engines and three were sixes. None of the six-cylinder cars were running at the finish, three of the four-cylinder cars were still in the race and eight of the eight-cylinder cars were either running or had finished in the money. Eight of the 24 cars were of foreign design and manufacture and three of them finished, the first of them in the eighth place.

The cars that started showed marked uniformity in some of the principles and details of construction, despite the different number of cylinders in the engines. Especially is this true of the valve actuating mechanism. The Packards, the Miller engine cars, the Duesenberg and the



Left—The winning H. C. S. Springs are underslung from the tubular axle. Right—Engine of the Duesenberg car. Note housing for rubber bumper used in place of spring shackle

Left—Miller-built Durant special with Miller eight-in-line engine. Eight carbureters were used, one float chamber serving each two carbureters. Right—Four cylinder Mercedes engine. The Mercedes engines were equipped with blower type superchargers

Mercedes used for valve actuation the direct acting type of mechanism that has always been associated with the Hispano-Suiza engines. The Mercedes valve action is very similar to the Hispano and makes use of a disk fastened to the cam end of the valve stem. The cam of the overhead shaft bears directly on this disk and the side thrust on the stem is taken by the unusually long valve guide.

The valve actuating mechanisms on the Miller, Packard and Duesenberg engines are practically identical, the only difference being in dimensions of component parts. This mechanism is a modification of the Hispano type in that the cam lift is transmitted to the valve stem through the medium of a thin walled cylindrical cup interposed between cam and valve stem. Harry Miller first used this system on his 183 in. engines and it is retained this year on the 122 in. job. The cylindrical cups, one for each valve, are carried in an aluminum housing which is held to the cylinder block by studs. The cups are formed with either a dowel pin or a machined-on key which prevents their rotation in the housing. The closed end is of thicker section than the walls in order to provide a suitable surface for the cam. There is no clearance adjustment between cam and cup. If it is necessary to increase or decrease this distance, a thicker headed cup is installed or, in the case of not enough clearance, the valve stem length is decreased by grinding.

These 122 in. cars, which have shown that they can equal the speed of 183 in. cars, differ from the 183 in. products in that they have, generally speaking,

1. A higher crankshaft speed
2. A higher compression ratio
3. A proportionately heavier and better mounted crankshaft
4. A proportionately larger gas passage

High Engine Speeds Attained

An example of the speeds at which the engines ran during the race is illustrated by the fact that the Bugatti engine was run at a speed of 5500 r.p.m. on the straightaway, the Miller engines at 4300 r.p.m., the Duesenbergs at 4600 r.p.m., the Mercedes at 4600 r.p.m., and the Ford engine at more than 3900 r.p.m.

The high compression ratios demanded use of special fuel. The Barber-Warnock Ford, with a compression of 8 to 1, used Midgley's compound. The Bugatti team brought over their own fuel which consisted of a benzol mixture made necessary by a compression ratio in excess of 7 to 1. The Mercedes cars used practically a straight benzol fuel. The Miller engines were also of the high compression type with a ratio of approximately 7.8 to 1, and although the drivers were not uniform in their selection of fuel, all of them used either a patented compound, a benzol mixture, or a very low end point gasoline. The Duesenberg with a compression ratio slightly above 7 to 1 used a benzol mixture.

The Miller engines, which were the most numerous on the track, are fundamentally the same as the 183 in. straight eight engine used by Miller last year.

Miller Uses Five-Bearing Crankshaft

The most outstanding change in the construction is the use of a five-bearing crankshaft as compared to the three-bearing type of last year. The shaft in the 122 in. engine has approximately the same dimensions as that in the larger engine but is carried by four plain bearings and one annular ball bearing which is at the flywheel end. The camshaft with nine bearings, one being of the ball type, is retained in the design of the 122 in. Miller engine.

The crankshaft of the six-cylinder Packard is carried on three bearings, the two end bearings being of the ball type and the center one a plain bearing.

Four bearings are used on each camshaft, the end bearing an annular ball and the center plain. Fred Duesenberg designed a crankcase for his 122 in. engine in which either a three or five-bearing shaft could be used. Only one Duesenberg car was completed in time to qualify and it was equipped with a three-bearing single piece crankshaft. The front and rear bearings are of the annular ball type, while the center is a plain bronze backed bushing carried in a split removable cap assembly.

The Mercedes engine is an all-roller bearing type, the crankshaft being carried on three roller bearings and the big end of the connecting-rod also carried on roller bearings.

The construction feature most important in the success of the Barber-Warnock Ford is the unusually heavy three-bearing crankshaft which was designed and manufactured by Arthur Chevrolet. This shaft is practically

as heavy as the one used in the 183 in. Frontenac race cars of last year. The diameter of the crank pins and journals on this shaft is approximately 1/8 in. larger than the regular Ford shaft while the armor cheeks are about five times as heavy as the original Ford shaft. The crankshaft itself is machined out of a solid billet of steel and is carefully balanced.

The Bugatti shaft, which has been described previously, is a two-piece built-up job with three bearings of the ball type.

The Durant, the H. C. S. and the 183 in. cut down Miller engine cars were equipped with eight carbureters, and with one float chamber serving for each two carbureters.

The Bugatti carried four horizontal outlet Zenith carbureters, each with a fine mesh screen over the intake. There were two exceptions to this on the cars driven by Prince Cystria and De Viscaya which were equipped with only two carbureters.

The Duesenberg used four Omac carbureters of 1½ in. opening.

The Barber-Warnock Ford with the front eight-valve model, R S head was equipped with two model U6 Zenith carbureters of 1½ in. diameter.

The Packards carried six carbureters of special design. The size of the gas passages and the diameter of carbureter were not available as considerable secrecy has surrounded the construction of these cars.

The four-cylinder Mercedes made use of the special Mercedes carbureter in connection with the Mercedes blower type supercharger. In every case, the carbureter outlet diameter of 122 in. engines is about the same as the 183 in. engines of the same make last year.

Although details of construction about the Mercedes racing engines were impossible to secure, information was given freely regarding the principles of construction. The supercharger is the chief item of interest on these cars which, considering their weight, showed a very good performance as regards speed. Two of the cars finished and the third was eliminated on account of being crushed against the inside wall at the south turn.

Blower Type Supercharger on Mercedes

The supercharger on the Mercedes is of the fan or blower type, the mechanism of which is mounted in an aluminum housing at the front end of the engine just above the crankshaft. It is connected to and receives its drive from the crankshaft through bevel gears. The blower operates at 1½ times crankshaft speed. On the forward end of the crankshaft is a disk clutch which is actuated by the foot accelerator and is connected to it by a linkage. The lower part of the aluminum housing carries the mounting of the bevel gears and directly above these gears, in a divided compartment of the same housing, is the blower proper. Above the blower is a small impeller which serves to regulate the fuel supply when the supercharger is cut in. The outlet side of the blower is connected to the air inlet of the carbureter which is separate from the regular air intake. When the accelerator pedal is depressed a certain distance, the pedal linkage closes off the normal air intake, engages the clutch on the blowers and raises the additional power jet in the carbureter which admits the mixture which is delivered through the jet orifice under pressure from the blower.

The supercharger on the racing car differed only in detail from that used on the 10-40 and 6-25 Mercedes stock models. The effect of the superchargers was very noticeable on the track, the character of the engines seeming to change entirely when the speed was reached where the superchargers were cut in. In connection with the supercharger, the Mercedes engine carried two camshafts, each of which operated two valves, there being no inlet valves and two exhaust valves for each cylinder.

The Duesenberg car was designed to be equipped with a supercharger of design similar to the Mercedes, but delays in securing parts and completing machine work prevented its completion in time for the race.

Reduction of unsprung weight was a big factor in securing greater speed. Practically all the cars used either 29 x 4½ or 30 x 5 in. tires and very light wheels. Tubular front axles or I-beam axles of very light section were employed on these cars. The rear axles on every car, with the exception of the Mercedes, were of built-up design where every effort was made to secure strength with minimum weight. An example of just how far the designers have gone in reducing this unsprung weight is seen in the construction of the Duesenberg 122 in. car. The front axle of this job complete, less wheels, weighs only 54 lb. The rear axle on the same car, complete with ring gear and bevel pinion, weighs only 104 lb. The Miller cars employ practically the same construction on the front and rear axles as the Duesenberg and the weights will not show a great variation.

Effort to Decrease Weight of Road Wheel

In addition to reducing the weight of front and rear axle to as low a minimum as possible, there also is a noticeable effort to decrease the weight of the road wheel. Last year the Fronty-Ford, entered by the Chevrolet brothers, introduced the Dayton wheel with light gage center depressed rim.

It is stated that this wheel weighs approximately 20 lb. less than the type of wire wheel used previously. This reduction in weight is possible because this design eliminates the necessity of side rings. The rim on this wheel might be considered a clincher rim, although straightside tires are used. The tire is installed on the wheel by placing the first bead over the clincher part of the rim and allowing it to rest in the depression at the center of the rim. Then the opposite bead is very easily forced over the rim. No trouble was encountered with front or rear axles and there was not a single instance of trouble traceable to a weakness of the wire wheels.

All the Duesenberg and Miller cars were equipped with Delco 8-volt ignition, the ignition unit operating at camshaft speed. Two of the Packards used Delco, while the car driven by dePalma was equipped with a Scintilla two sparks per revolution magneto. This necessitated a magneto speed of 700 revolutions when the engine was turning 5500. The Bugatti carried four-spark Robert Bosch magnetos turning crankshaft speed. The Mercedes used a two-spark Robert Bosch and the Ford a Scintilla. All engines except the Ford were equipped with single ignition and one spark plug per cylinder. A feature of the Duesenberg was the use of siphon pump instead of air pressure for the fuel feed.

The tire equipment on the cars was either Firestone or Century and, in connection with this, it is interesting to note that Ford equipment was Century cord as was the tire equipment on the car driven by Frank Elliott which finished in sixth position.

A PATENT has been taken out in England by D. Napier & Son, Ltd., covering essentially a joint between a steel cylinder and a cast aluminum cylinder head.

In order to render the joint gas-tight in spite of differences in heat expansion a steel gland nut with a conical seat is screwed over the lower end of that portion of the cylinder head which screws over the cylinder. That part of the aluminum head which is depended on for a gas-tight joint is thus confined between two parts having the same coefficient of expansion.

Just Among Ourselves

Now the Used Sport Car Adds to Dealers' Woes

USED cars, like taxes and traffic accidents, are always with us but dealers, naturally, suffer most from them. An inelegant philosopher once remarked that "carbuncles are a misfortune but whiskers are a man's own fault." The used car is the dealer's carbuncle. Cute little new kinks are always cropping up in the business. Now it's the used sport model. When it's new and all dolled up with bright nickel and everything, it's a handsome piece of work, but the dealer detests 'em when they're offered in trade. The owner always wants a bigger allowance than he could get on a standard touring car but the dealer can't sell them for as much unless he spends quite a lot of money replacing the trimmings. When a sport car is not treated kindly it soon acquires a disreputable appearance which seriously affects its resale value. But the calloused dealer regards it simply as another little grief added to an already large family.

Many Dealers Are Learning How to Handle Used Cars

USED cars are backing up in a good many sections and in a few they are piling up distressingly fast but the situation isn't as bad as might have been expected at this time of year. In fact, it seems to be better than it was last June. There are a lot of good dealers who have the used car problem solved. There has been no magic about it. They have just applied good business principles and that's all they needed. President Sloan of General Motors hit the nail on the head the other day when he said that the severity of the used car problem increases as the dealer's business ability decreases. This doesn't mean, however, that the factories have no responsibility. All dealers aren't good business men and they probably never will be. If they aren't sub-normal mentally, however, most of them can be trained and money spent in training them is a good investment. Most factories have a long way to go yet in dealer education methods.

English Maker Pays High Tribute to American Labor

GEORGE F. SUMMER, president of the English company manufacturing the Deemster car paid high tribute to American workmen the other day. When he was asked why he had organized an American company to make the Deemster car at Hazleton, Pa., primarily for the British market, he replied: "It's because of the American workman; they work over here." He gave the impression that labor efficiency is very much higher in the United States than in his own country. He expects the American Deemster to sell in England for about $1100, including duty and freight, whereas the English built car sells for $1600 of which about half is actual factory cost. Under the circumstances it is small wonder that American motor cars have captured the markets of the world.

Ford and Chevrolet Make New Production Records

PRODUCTION statistics for May are highly gratifying, but they don't reflect the situation with exact accuracy. The biggest producers in the low priced field, notably Ford and Chevrolet, are turning out cars faster than they ever did in their history. The same is true in a few other factories but not many. The volume of output was maintained as it was only because of the record made by the biggest producers. This seems to indicate that there has been no diminution of demand for low priced cars. Ford is approaching 7,000 a day and Chevrolet, 2,000. Price evidently is a considerable factor in sales. It may be that a lot of people are buying less expensive cars than they intended. But many of them want closed models. Apparently they would rather have a sedan in the low priced field than a high class touring car which would cost as much.

THE Chevrolet company is doing an enormous business. Some of it is due to the big advertising campaign which is being carried on, some of it to the excellence of the product and some of it to the earnest, intelligent effort of a steadily expanding dealers' organization. The biggest single production day, thus far, was about 1,825, counting engines. Sales for April, including Canada, considerably exceeds 40,000. Dealers' orders in May aggregated more than twice that number. Rather out of line with the general trend, dealers in some sections are calling for more open than closed models, some in the proportion of four to one.

Small Engine Development Advanced by Big Race

THE big Indianapolis race has demonstrated again that high speeds and remarkable efficiency can be attained by cars powered with engines so small they would have been considered toys by race drivers only a few years ago. When the sweepstakes first were run there was no limit to

More or Less Pertinent Comment on Topics of Current Interest to Men in the Industry

the size of the engines and some of the cylinders were so big the mechanician could poke his head in them. When they roared around the track it sounded as though a battery of heavy artillery had gone into action. Then the piston displacement began to be reduced to follow European practice. First it was 600 cu. in. and under, then under 450, then 300. It came down to 183 cu. in. in 1920 and was reduced to 122 cu. in. this year. The engines used three years ago were about the size of those in Fords and this year they were a third smaller. The reliability and high speed of the American built engines are gratifying to the entire industry. While it rejoices at the victory of cars flying the Stars and Stripes it regrets that the foreign entries could not have made a better showing. Congratulations are due Carl Fisher and James Allison who own the speedway. They have done much for automotive engineering.

Home Market Overlooked In Seeking National Sales

IN a certain State there are ten companies manufacturing passenger automobiles. One of the companies is close to the top of the industry in point of production and does a big business on a national basis. The other nine companies together sold a total of 237 cars in the biggest city of the State, with a population of 275,000 in the first quarter. The motor car registration in that city last year was 47,000. This indicates that some of these companies have failed to cultivate their home markets while they have been striving for national distribution. Most States naturally are proud of their own products and they believe in supporting home industry. Eight of the nine companies make exceptionally good cars. The ninth has been practically out of production since the first of the year.

FEDERAL excise taxes on the sale of motor vehicles and accessories for the month of April approximated $10,000,000. This indicates that Americans paid nearly $200,000,000 for automotive equipment in that month or at the rate of $2,400,000,000 a year. April was a record breaking month but the rest of the year has not lagged far behind. Verily, the automotive industry has grown to astounding proportions.

"Sell Public on Roads" Is Advice of Shirley

H. G. SHIRLEY, the progressive chief highway engineer of Virginia, touched a vital spot in the national highway development program when he told the American Automobile Association in his annual report as chairman of the Good Roads Board that "a campaign of information is necessary to sell the public on the importance of building connected highways and on building them strong enough to carry a reasonable traffic load." He stressed the reaction on the part of taxpayers and legislators against the expenditure of large sums for road building and called upon organized motorists to carry on the work of education with renewed zeal. It is a task in which the entire automotive industry should join with enthusiasm. Good roads are an asset of inestimable importance to the nation and unless the system is steadily enlarged the sale of individual transportation will be limited.

Highway Snow Damage Costs More Than Removal

SNOW removal usually is a subject of merely academic interest in the summer time. It may exert a cooling influence when torrid breezes are blowing but it is mighty difficult to get anyone sufficiently interested to do anything tangible about it. The subject is one of genuine concern to the automotive industry, however, and it should be to all State highway departments. Where snow was not removed last winter it caused unusually heavy damage on the highways. Hundreds of miles of highway have been found where deep ruts have been worn in the hard surface because cars and trucks, in steady procession, moved along the same groove when accumulations of snow and ice made chains necessary. Repairs to these roads will cost much more than it would to have kept them free of snow in winter. Negligence in this respect resulted in actual waste of highway funds in addition to slowing up highway transport.

SAM MILES, the veteran show manager who is known to everyone in the industry, is having a run of tough luck but he is taking it in his usual philosophical spirit and making no complaints. He returned from his annual trip to England after the show season with a twisted knee which kept him laid up at his hotel in New York. He tried to walk too soon with the result that he snapped two bones in his right leg and had to go to a hospital. Happily, his stay there will be brief and he will soon be able to go to his summer home at Christmas Cove, Maine. He promises to be as fit and chipper as ever before the time comes to make active preparations for the 1924 shows.

J. D.

Analysis of Car Sales in *OHIO* Shows Changing Trends

Percentage Gain of Registrations in OHIO has been

3.6 times as great as the percentage gain in number of dealers since 1917

32 times as great as the percentage gain in population since 1915

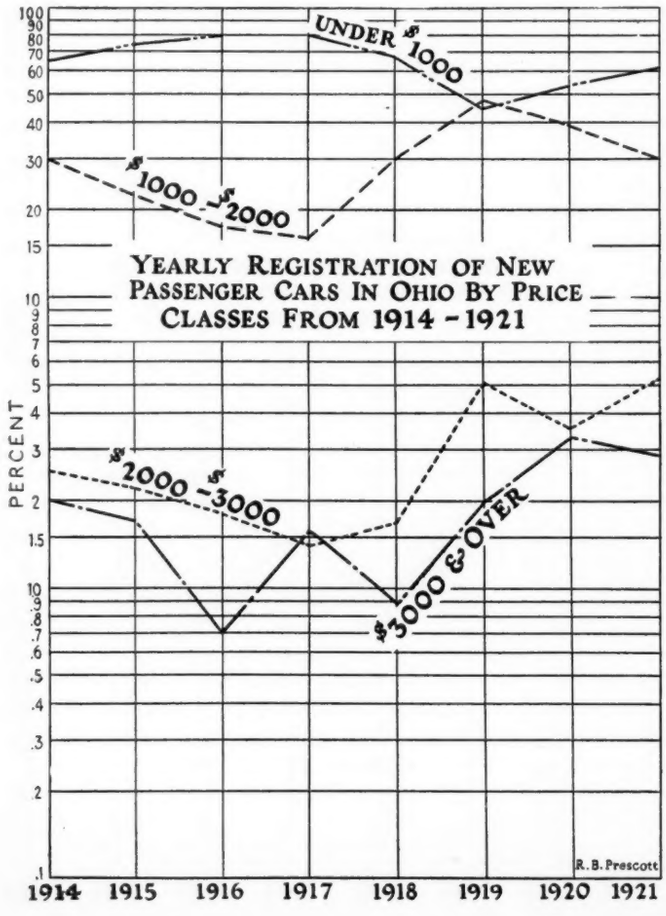
95/100 as great as the percentage gain in United States registrations since 1915

THIS is the third of a series of articles which will give market analysis data for important States. New York and California have already been discussed. Pennsylvania will follow next.

The data given indicate the relation between the various factors involved in selling automobiles and the trends that have been developed in past years. They form an excellent basis upon which to make reasonable predictions about the future.

OHIO offers a relatively good market for high-priced cars, sales in this group having comprised a larger percentage of the total than in the country as a whole. This is indicated in Fig. 1, which shows that the $2,000-$3,000 and the "$3,000 and over" groups have held up well since they started to climb in 1918. The chart shows the percentage of new cars sold each year comprised by each price group.

Ohio registrations as a whole, however, are not increasing as rapidly as those for the United States, while the growth in number of dealers has fallen considerably behind registrations.



The population growth curve for Ohio rises less rapidly than that for California, the State last discussed. New sales in Ohio will not be large relatively when the period of stability has been reached. The slow upward trend of the population curve, however, indicates that the period at which registration and population curves will be the same is still far in the future.

These are the chief features revealed by a study of the registration analysis for Ohio. Further examination brings out a number of details valuable in making sales plans. Viewing the analysis from this angle, the basis of the curves used in Fig. 1 should be clearly understood. The total number of new cars sold in the State each year was taken as 100 per cent. The total was subdivided into the four price classes indicated, the number in each price class being expressed as a percentage of the total new cars sold in each year.

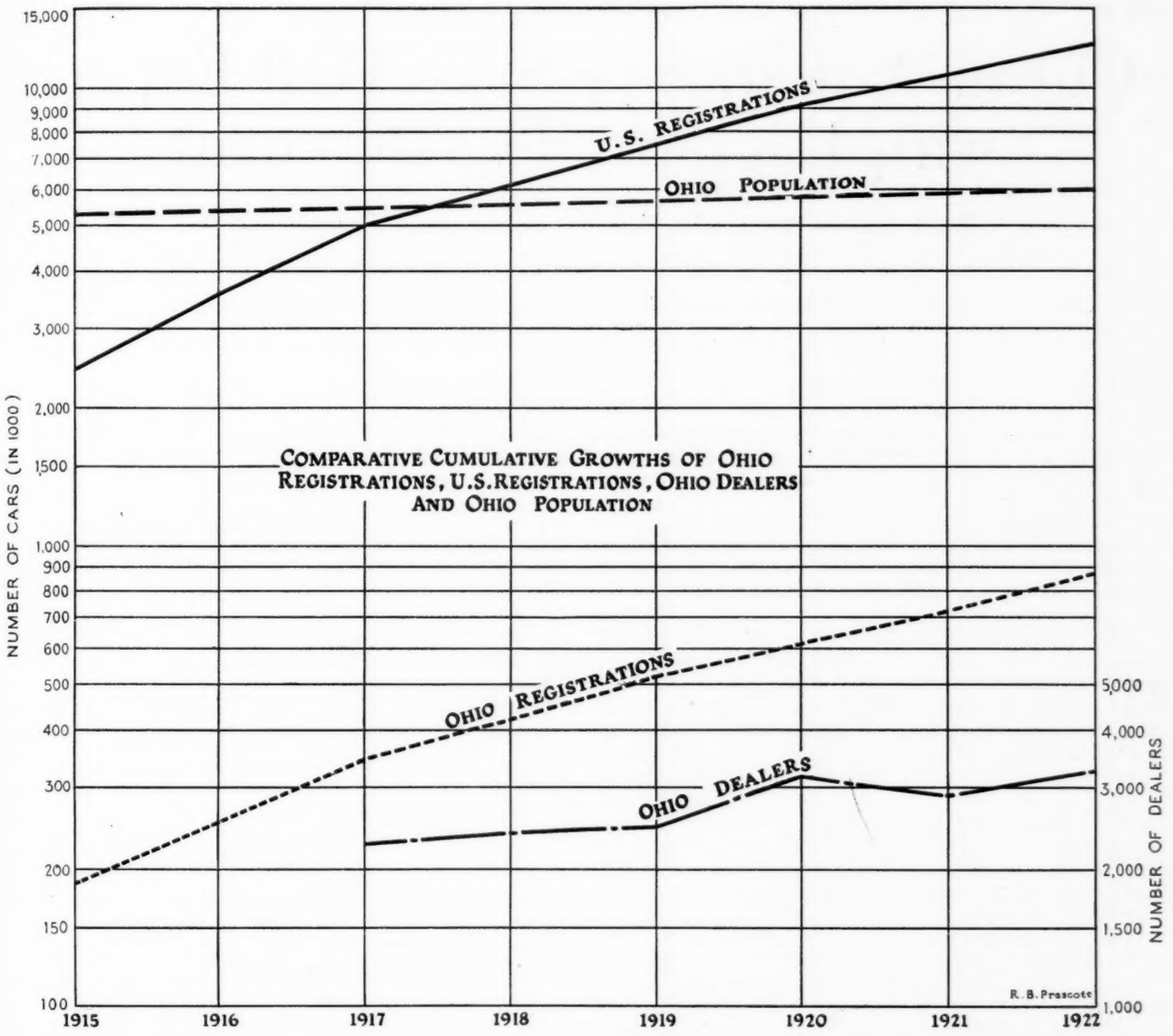
Relatively speaking, the lower priced cars have fallen off somewhat in popularity during the last five years. In the big buying year of 1919, strange to say, more cars were sold in the $1,000-$2,000 class than in the "under $1,000" group. Since that time, however, these two groups have tended to assume their normal positions in relation to each other.

Cars priced at more than $3,000 have done especially well in Ohio since 1918. Despite the fact that they fell off slightly in 1921 they still comprised nearly 3 per cent of the total cars sold in the State during that year. This is somewhat higher than the proportion of expensive cars for the country as a whole in 1921, the percentage in that case having been 2.3.

The recent increase in "under $1,000" cars seems to have been at the expense of the $1,000-$2,000 group, since no material decrease is to be noted in the two higher priced groups considered together.

Some of the variations in the curves for the two high-priced groups are due primarily to the change in price of the Cadillac with its relative heavy production. The curves do give a true economic picture of buying trends without respect to the individual cars involved.

The curves in Fig. 2 are built up on a cumulative basis, as opposed to the yearly new car sales basis, used for the



price class groups in Fig. 1. The general trends deduced from these curves have already been indicated.

The percentage gain of registrations in Ohio has been 3.6 times as great as the percentage gain in number of dealers since 1917, but has been 5 per cent less than the percentage gain in United States registrations as a whole. There may be some relation between these two conditions. More dealers may be needed to push sales ahead faster. The number of cars per dealer, however, has increased from 151 in 1917 to 268 in 1922.

Percentage gain of registrations has been 32 times as great as population in this State, the number of persons per car having been reduced from 30 in 1915 to 7 in 1922. Density of cars per square mile has increased accordingly, having risen from 5 in 1915 to 22 in 1922.

The tremendous growth of car use is indicated by the fact that Ohio registrations have been multiplied 2½ times in five years, although the number of dealers has multiplied only about 1½ times in the same period.

Only a few more dealers are selling cars in Ohio today than in 1920. Many retailers went out of business during the 1921 slump, and considerable difficulty was experienced in keeping organizations up to their proper size. Manufacturers waged vigorous campaigns for dealers in the latter part of 1921 and all through 1922, however, and many new merchants were brought into the business. The result in Ohio has been to recoup all the losses and to make a slight gain. That gain has not been proportionate to the increase in car sales, however, and more dealers will be needed in this territory to provide the necessary selling effort in the period of keen competition that lies ahead.

Taking these facts into consideration, sales in Ohio have moved forward at a remarkably rapid pace in the last few years. The great registration gain, coupled with the slow dealer increase, indicates that sales have been affected much more strongly by general economic conditions than by number of retailers. It may well be argued, nevertheless, that if more dealers were put into Ohio the sales increase might be accelerated materially.

The increased density of automobiles in this State indicates that the traffic problem will have to be considered more fully every year. Where there were 5 cars per square mile in 1915 there were 15 per square mile in 1922, as already noted. In the urban centers, such as Cleveland, Cincinnati, Dayton, and so forth, traffic difficulties have already begun to exert considerable sales resistance. Lack of parking space makes car use difficult, while density of traffic makes driving less pleasant than otherwise it would be.

Cuban Automotive Sales Will Expand with Highway Development

Road construction will follow overcoming of governmental difficulties. Island well supplied with garages and filling stations. Alcohol used in large quantities as fuel. Keen competition in tire merchandising field. Motor show needed.

By George E. Quisenberry

THE story of the automobile in Cuba cannot be divorced from general political and economic factors. For the moment, the more important consideration is sugar and the state of the sugar market. The long-range viewpoint, however, must turn itself into the realms of politics and other intangible subjects, the discussion of which is difficult and the future course of which is entirely problematical.

Bound up in the political situation is the question of roads and road improvements. One prominent distributor in Havana believes that with good roads the Republic would require 300,000 automobiles rather than the 25,000 or 30,000 in use at present. Great sections of the island are today without adequate transportation or communication facilities of any sort. Automotive traffic is confined to the city streets or the immediate suburbs. It is attended with great difficulties if long trips are attempted. Something of this condition prevails in the United States and in other countries. It is a primary principle that roads and road construction must everywhere be of the utmost concern to the industry.

When the millions were dancing in the mad sugar orgy of three years ago, Cuba undertook extensive road construction work. Public improvements were conceived in a lavish manner. Some contracts were completed and work of some character actually undertaken on others. Many thousands of dollars were expended, usually but not always through political contractors who did or did not build the roads or pave the streets according to contract. The result was what might have been expected, and it was not unlike some of the road building experiences in this country.

Many kilometers of good highways were completed but other projects were grossly mishandled. Condemnation must be tempered by the reflection that the Cuban efforts at self-government are no more than twenty years old, whereas our own extend back a century and a half. We may commiserate with them, but with fingers crossed.

THIS is the second article by this author presenting a detailed analysis of the Cuban automotive market.

The writer points out the sales potentialities of the Island and tells facts which the American exporter of motor vehicles should know to obtain maximum results in this field.

Be that as it may, road work ceased completely with the moratorium, but politics continued as usual. Major Gen. Enoch Crowder made his appearance in Havana as the representative of the Washington Administration and began the laborious task of putting the pieces together again. Millions of dollars were owed by the Government, office-holders were everywhere, and the Cuban budget was far out of line with revenue. Sugar was a drug on the market and planters thought themselves lucky if they could sell their product on any terms.

Debts Being Paid Off Slowly

Gradually, however, conditions mended. A debt commission got to work sifting the wheat from the chaff in the Government debts, and these are slowly being paid off, although the business men of Havana complain at the slowness with which payments proceed. Useless Government employees were cut off, finances were placed on a better basis and a $50,000,000 loan was obtained from the United States, about $6,000,000 of which was earmarked for public improvements. A small surplus appeared in the Cuban treasury, the over-stock of sugar disappeared and prices went up. The pendulum was swinging the other way.

Cuban planters and business men today are paying off their debts. Some large concerns, which wrote off heavy losses, are receiving payments on old bills, and in quite a few instances this cash is on accounts which had been considered impossible of collection. One large company, which expected that its losses would be exceedingly heavy, now is figuring them at no more than $5,000. This is remarkable in view of the wide range of its accounts.

Other firms were not so fortunate, but the fact may be stressed that reputable business houses are paying off their old obligations; honest houses and individuals are wiping the slate clean. All of this means that frozen credits are being thawed out, that money is going into circulation and that business is becoming active. Private construction is on a relatively large scale, although the sugar mills and industrial concerns figure but slightly in this work . The automotive industry may draw its own conclusions.

Cuba needs roads very badly. Havana needs paving or street repairing in every section of the city. Automobile dealers and business men in general are keenly aware of these requirements but they are pessimistic as to the immediate possibility of obtaining such construction. No concerted demand has been made upon the Government for road construction, and unless calls of this character are made imperative the highway and paving programs probably will drift along with a minimum of results.

Shortly before the boom broke, one of the larger American automobile companies, through a representative on the island, undertook to form a Good Roads Association, backed by automotive dealers, business men and such organizations as Chambers of Commerce, Rotary Clubs, etc. This effort was suspended, however, and has not been resumed. Dealers believe that the time is ripe for such an organization, but the initiative is lacking. Perhaps the automotive industry can supply the leadership, for the returns would be tremendous over the next three or four years.

Roads have been built many times on paper and by contract. The much-heralded Central Highway, from Havana to Santiago, bisecting the island and having a total length of more than 500 miles, has been "constructed" frequently, but it is impossible to drive through the central provinces of Matanzas, Santa Clara and Camaguey and the terminals at Havana and Santiago are difficult for traffic. Various proposals have been broached concerning the highway, one of which, according to rumor, involved the use of the national lottery funds to guarantee construction and maintenance, and there can be no doubt that it will ultimately be built. The time depends upon public opinion and public demand. With its projected branches, this road will open every section of the island to modern transportation and end the isolation in which many communities now find themselves. Cuba lacks satisfactory railroads and highway transportation appears to be the only practical method of ending the present conditions.

Optimistic Side to Highway Problem

As there is a pessimistic side to the highway problem, so also is there an optimistic side. Some road work is even now under way and, once the Government has cleared its present difficulties, more will be undertaken. The Havana road to Guanajay, some 45 kilometers from Havana, was put in excellent condition for the automobile races on May 20, this being at the instigation of one of the newspapers.

A recent announcement stated that the Piñar del Rio Highway, which continues the Guanajay link for nearly 200 kilometers to the chief city of the tobacco district in the extreme west of the island, would be repaired and and that materials for the work had been ordered. In other sections, materials for repairs have been available for three years and probably will soon be put to good use. During the dry seasons, roads are passable and recently drive-aways of considerable distances have been made out of Havana to local automobile dealers.

In Havana, the streets in the industrial and factory districts are in bad condition and are so destructive to motor vehicles as to make the demand for replacement parts exceedingly heavy. In the central business section, streets are well maintained and the wonderful boulevard leading south along the shore front to Vedado, Miramar, Marianao and Marianao beach has been repaired and put in excellent shape within the last six months. This is the "show" district of Havana. It contains the finest houses, the most beautiful parks and is so handsome as to command much admiration. Connection is made with the Guanajay highway and motor travel, over smooth roads, is now possible for many kilometers.

Road conditions are one of the limiting factors to the automobile business but the future is not as black as it is sometimes painted. Cuba has made a wonderful advance within the last two decades, since its freedom was obtained and its real development began. Visitors are going to the island in ever increasing numbers. Automobiles are penetrating further and further into the interior and their use is steadily enlarging. All of these are favorable factors.

AS Cuban roads are developed sales will multiply rapidly. The Island has made wonderful advances in the past two decades and highway construction is now well underway.

More and more roads will be built as the Government gets on firmer footing and the need for transportation will be met by the American producers of motor vehicles. Sound representation will reap returns.

Scarcely a town throughout the island is without its garage or fuel station. In some places, the local hardware store carries small stocks of automotive equipment and has the ever present fuel pumps, which dispense both gasoline and alcohol. In others, garages or dealer establishments have been opened and, consequently, service facilities of some sort are generally available. Bulk distribution of fuel is not possible everywhere, it is true, and gasoline is still sold in the tins so familiar to export officials, at a cost which may run as high as 65 cents a gallon. But here again much progress is being made.

The fuel situation in Cuba is eminently satisfactory, with both gasoline and alcohol motor spirit being used. Every garage and automobile establishment in and about Havana maintains two fuel pumps, one for gasoline and the other for alcohol. Gasoline at the moment is selling for 36 and 37 cents, having declined from the high point of nearly 50 cents per gallon. The alcohol spirit now commands 23 cents, an increase of from three to five cents per gallon since its first use about two years ago. The result of the diminishing margin between the two fuels has cut considerably into the sales of alcohol, which requires from 30 to 50 per cent greater volume than gasoline. The alcohol is being used in large quantities, however, chiefly in the smaller cars, and good results are claimed from it. It is distributed by tank wagon in bulk, and carburetor changes are the only alterations necessary in the cars using this fuel. Special cylinder heads, by which compression could be raised to meet the requirements of the fuel, probably would find ready market but no attempt is made to use other than standard equipment.

It may be said that the immediate outlook for passenger car and accessory sales is bright, promising larger returns when the new season gets under way. Plans have not been made for a Havana motor show to inaugurate the forthcoming sales period but. in the opinion of several dealers, it would be a desirable merchandising move. November or December is suggested as the logical time, as the wealthier Cubans have then returned from their summer sojourns abroad and as sugar cutting gets under way soon afterwards.

Automobile Show Lacks Support

One or two attempts have been made previously to hold motor exhibitions but, lacking cooperative organization, their success has not been great. Manufacturers undoubtedly should get behind the show movement, insisting that it be held by the dealers themselves, with the usual cooperative features and wide advertising covering all sections of the island. If sugar prices hold to anything like their present levels and crops are good, the success of an exposition is assured.

European cars and European equipment naturally have but little importance in the Cuban market. A few models of one European car are to be seen and some trucks, mostly German, are held in stock. An occasional spark plug or

other equipment from the Continental factories may be found, but American types of equipment of all character are universally used. One of the larger distributors has had under order for some months six cars from a European maker, whose vehicles flooded the export field prior to 1914. Thus far, the Havana distributor has had no notice of intended shipment and is becoming doubtful of their ultimate receipt. As the company is receiving excellent deliveries of the American lines it represents, it probably will not attempt to repeat its European venture.

Tire Competition Keen

One European brand of tires is creating considerable confusion for the moment in Havana. This company, as it has done in other export markets, has undertaken a price-cutting campaign and is placing its tires on either long terms or on consignment basis. A reduction ranging from 11 to 16 per cent on various sizes was made, without public announcement, in April and with results that have caused some demoralization. Other brands have met this competition as best they could and are being maintained until such time as the higher prices for crude rubber and cotton force a revision.

The tire field in Havana is scarcely brighter than it is at home. Competition is keen, large stocks must be carried, and distribution is not always satisfactory. Cord tires have practically replaced fabrics, except in the smaller sizes and their use is widening even there. A small demand continues for millimeter sizes but this is becoming negligible, just as is the clincher demand for all sizes other than for Fords and similar vehicles.

A recent count showed more than thirty brands represented in Cuba, of which, however, no more than a quarter or a third are being actively pushed. Two American companies maintain branches at Havana, with considerable stocks, and are finding sales on the increase. Some of the American lines have wide distribution throughout the island and in Havana, where they generally are sold through garages and automotive establishments. Havana has only a few exclusive tire stores, and they are chiefly distributors of a specified brand. Vulcanizing shops exist in Havana, although their number is not large. Tire demand is heavy, ranging from 4 to 4½ tires per year under normal conditions, and observation of the cars parked along the streets seems to indicate that little or no success has yet been obtained by any makes other than American.

Italian Manufacturers Adopt Features of American Design

AN analysis of Italian car design reveals a very close following out of American automotive practice. Such a study has been carried on at the recent Milan Show by A. Patzig, chief engineer of the Hansa-Lloyd Works at Bremen. Patzig declares that Italian manufacturers have adopted the superior features of American design with much greater rapidity than have German manufacturers.

The following tables show, on a percentage basis, typical American engineering features found on nine Italian chassis:

a. American features adopted universally (100 per cent):

Unit powerplant
Cylinders cast in block
Central gearshift
Pedals fixed to powerplant
Brake lever fixed to powerplant
Electric starting and lighting equipment
Detachable starting crank

b. American features widely adopted:	Per Cent
Detachable cylinder head	89
Dry plate clutch	89
Fuel tank at rear	78
Banjo type axle	67
Intake manifold cast in head	67
Three-point suspension	67

c. American features often represented:	Per Cent
Ball type gear shift lever	45
Vacuum feed	45
Absence of reverse guard	33
Double brakes on rear wheels	33
Shock absorbers	28
Cylinder block cast integral with top half of crankcase	22
Double universal joints	22
Flexible fabric disks	22
Battery boxes inside	22

d. American features not used:

Left hand drive
Thermostat

d. American features not used (continued):

Fork type axles
Disk wheels
Contracting band type brakes
Power driven tire pump

e. American features adopted (percentages lacking):

Rear axle made of sheet steel stampings
Helical bevel gears
Timken roller bearings
Woodruff keys
Substitution of stampings for castings.

The above statistics are based on the number of different types exhibited at the Milan show and do not take into consideration the quantity of any one type produced. Were this not done the features of the large cars, seldom seen on the Italian car market, would be dominated by those of the small car.

ACCORDING to a recent report of the British Board of Education, the educational needs of the automobile industry do not differ widely from those of other branches of mechanical engineering in which there is a great deal of repetition work.

Engineers at first should be educated along the broad lines of general mechanical engineering, and specialized instruction of a superficial kind often given prematurely under the title "motor engineering" is deprecated.

Not until the student has completed three years' work in a senior course should any specialization be permitted, although it is justifiable and useful to take examples in drawing and mechanics from the particular kind of practical work on which the student is engaged.

There is said to be a general deficiency in laboratory equipment suitable for students specializing in automobile engineering. Degrees in "motor car engineering" are deprecated, and in their place the degrees in mechanical engineering issued by the Institution of Mechanical Engineers in conjunction with the Board of Education are recommended.

Packard Links Up Service Reports with Engineering Work

Special department capitalizes on information secured from cars in operation. Stock disbursements, defective parts and field records carefully watched. Prompt changes in design made when necessary. Problems handled in personal conference.

By J. Edward Schipper

BY the establishment of a service engineering department, the Packard Motor Car Co. has linked up its service records with its engineering work. The creation of this department has made available information gained by contact with the user in such a way that it not only is quickly available to determine the need for making improving changes at once, but also is of material benefit in shaping the trend of future design. Creation of this department has eliminated danger of valuable service information becoming buried, as well as the possibility of the engineering department overlooking minor improvements which the service department has the best opportunity of bringing to light.

Regardless of the thoroughness of the experimental department and the number of test cars the factory keeps on the road, there is nothing which can take the place of actual owner experience in determining the value of any design detail, particularly points of weakness or inaccessibility. The service department is the only one which will be certain to note the effect of adverse conditions which apply in certain territories where an experimental car might be sent only by accident.

Omitting the service work which is normally required, because of wear and accidents, and considering complaints from owners which apparently deal with design or production, it is found that complaints may be divided under three heads:

Complaints Placed in Three Groups

First, those which involve nothing wrong in design, materials or manufacture, but which are due to faulty work of the mechanic on the job or unsatisfactory handling at the service station.

Second, those which stand by themselves and are not applicable to the entire line such as cases where the tolerances have all been on the long side in an assembly so that they total an undesirable figure of trouble resulting from poor work in the assembly line which has escaped an inspector, new men employed on work in the factory, material bought from an outside source to cover an emergency situation or any other condition which may apply to a single unit or a group of units over a period of possibly 3 or 4 days.

Third, cases which really require improving changes.

In the first class where there is nothing actually wrong except perhaps the workmanship in the service station, a letter of instructions from the technical service department which sets right the particular station making the complaint would end the matter.

In the second class, where a single car or a run of cars is wrong because of some adverse circumstances, it would be a question of adjustment and probably replacement.

In the third class, where it appears that an improving change is really necessary, the technical service department turns the question over to the service engineer. It is his duty thoroughly to investigate the particular complaint to determine whether an improving change is really required and if so whether the change should be one of design, manufacturing methods or material.

Questions Handled in Conference

The service engineer gets together a very complete recommendation and takes it up with the chief engineer. After the service engineer and chief engineer have thoroughly threshed out the situation, it is taken to the particular department which is concerned. If it relates to chassis, for instance, it is taken up with the chassis engineer. The change is then drafted, approved by the service engineer and put through production. If it is a metallurgical matter, it is referred to the metallurgical department, or if it is manufacturing point, it goes to the factory manager.

The route of a complaint is from the owner to the service salesman, to the service manager, to the technical service department, to the service engineer, from which it branches to either the factory manager or the chief engineer and thence to the particular manufacturing or engineering department concerned with the particular piece involved.

The organization required to keep this system in operation is not complex. The technical service department functions as any other service department with its road men and its contact both by conference and letter with the service managers of the different distributors. The only additional part of the organization is the service engineering department which is comprised of two engineers and the necessary draftsmen. The service engineer is working continually in personal contact with the head of the technical service department.

When the system was first devised a number of forms were originated to carry reports from the technical service department to the service engineer. It was found that this method of contact was not as satisfactory as the personal conference, the forms were abandoned and the only written work by the service engineer is a monthly progress report which summarizes the work done and the disposition of questions which have reached him during the month.

The different subjects are covered by short memorandums from the technical service department to the service engineer. The progress reports and these memoranda form a complete record of the work carried through the service engineering department. The contact of this department with the chief engineer or the factory manager is by personal conference just as between the service engineer and the technical service manager.

The technical service department has eight men on the road. They are mechanics as in any other service department and they bring in a certain amount of information. It frequently has been the experience of the technical service department, however, that complaints which indicate a condition worthy of engineering investigation often require a personal visit to the locality in which the complaint originates. This visit is made, as a rule, jointly by the head of the technical service department and the service engineer. Where the trouble comes specifically under the jurisdiction of any of the branches of the engineering department, a representative of this branch probably would visit the locality also. A conference resulting from the visit of anywhere from one to three men to the point where the complaint originates affords a far more satisfactory method of reaching the root of the trouble than correspondence or dealings through road men.

The work of the service engineer does not stop after the improving change has been made and the cars are out in the field. It is a part of his job to follow up these cars and find out if the change has filled the bill and removed the cause of complaint. Furthermore, it is a part of his job to make the change in cars already in service whenever it is possible.

Fuelizer an Improving Change

A good example of this is the Packard fuelizer, which was put on as an improving change to meet the fuel condition which existed in a great many parts of the country, particularly in the colder belts. The fuelizer was designed not only to be applicable to the new models, but also to be fitted to the old with only minor changes in the old cars.

In addition to the work done by the draftsmen in the service engineering department, a great deal of additional drafting work is handled through the regular drafting room. The service engineer is thus equipped to accompany his recommendations with actual layouts of proposed changes which have been arrived at by careful investigation of the complaint and circumstances which surround it.

The service engineer does not handle recommendations for tool equipment which come through the service department. This is one of the functions of the technical service end and there is a man in that department who specializes on work of this kind. In the engineering department there is a service production engineer, who is continually studying the production of service parts so that the benefits of economical production can be extended to the purchases of replacement parts. Remarkable economies have been effected in this way. For example, the costs on four parts was decreased by $15,000 in 9 months. By changing the methods of production on some of the replacement gears, a saving of $8,000 a year was made. This saving is, of course, passed on to the purchaser of replacement parts, resulting in greater economy of upkeep on old models.

Information Gathered from Four Sources

The information which the technical service department passes along to the service engineer for his consideration comes from four different points:

Stock disbursement.
Defective parts returned.
Reports from the field from the service managers.
Investigations in the field by road men.

Stock disbursements, while forming a fairly good guide as to parts which require the greatest number of replacements, cannot be used without considering the fact that a great many of these orders are due to the stocking of parts by dealers. This is particularly true after a new model has been brought out.

When a new model is introduced, for example, a number of orders for piston pins might come in from all over the country. On the surface this might seem to indicate that piston pin trouble was being experienced but investigation probably would show that the service stations were stocking up on piston pins simply to anticipate orders in the future. Furthermore, it must be considered that some parts are wearing parts while others are non-wearing. High disbursements on a non-wearing part would indicate a bad condition, whereas high disbursements on a wearing part might simply indicate high mileage by cars in certain services.

Technical Service Anticipates Needs

The trouble with using the defective parts returned as a guide is that it takes too long for them to get back to the factory. Service stations often hold the defective parts until they accumulate in sufficient quantity to justify a freight shipment. It is the purpose of the technical service department as well as the service engineer to locate trouble as quickly as it appears. It often happens that the technical service department and the service engineer have made a study of trouble and put through a change before the dealer in the territory even reports it. Consequently, stock disbursement and defective parts returned are simply supplementary to investigations in the field.

The technical service department maintains its field contact in two ways. The service managers at the class A points, of which there are ten throughout the country, constitute a service board. This board meets every three months, sometimes at the factory and sometimes in the office of one of the distributors. These service managers are old Packard men, in the majority of cases having been with the company for a long period, and they are consequently so familiar with the product that their discussions are directly to the point. A large part of the information gathered by the technical service department comes from these men either through visits or at their meetings. Changes often are suggested at these meetings and these suggestions go to the service engineer for his approval.

It is a part of the function of the technical service department to time study repair jobs on new models and to design tools before the car is in production. This is done for two purposes: First, to provide the men in the field with the proper tools to do service work just as soon as the car is out. Second, to discover whether the design is easy to service.

Changes Made Before Production

Before a car is approved for production, it must have the O.K. of the technical service department, which has gone over it with the particular idea of accessibility in mind. The points which are difficult to service are altered, so that in this way a great many changes which otherwise would have to be made after the car is in production are foreseen and corrected.

As in the service engineer's department, blanks and forms are replaced by contact in the technical service department. Formal reports are made as a matter of record but in each case this report comes after the departments are thoroughly aware of the situation.

Analyzing the operations of the Packard method of handling service problems, it may be stated that the technical service department takes care of the maintenance and servicing of the cars in use while the service engineering department considers means of improving the servicing and performance of future cars. In other words, it is the function of the service engineer to interpret the lessons learned by the technical service department and apply them to present and future designs, making the changes applicable to the cars already out wherever possible.

Machine Tool Methods Being Perfected for Bearing Installation

Line boring has largely superseded hand scraping operation to obtain greater uniformity and accuracy of babbitt surfaces. Possibility of manufacturer handling replacement work for service stations widely discussed. Four practices outlined.

MACHINE tool operations have, in a large measure, replaced hand work for babbitt bearing fitting. The effort to secure as near a 100 per cent bearing surface as possible for main and connecting rods, has brought about the development of methods which secure extreme accuracy and uniformity of the crankshaft bearing surfaces. Without this accuracy and uniformity, hand fitting of the individual crankshaft bearings is almost necessary, at least for the final operations. If it is possible, however, to hold the bearing surfaces on the crankshaft to close limits, the use of machine tools for finishing the surfaces of the babbitt bearings is feasible.

In other words, the development of methods which provide greater accuracy on the crankshaft bearing surfaces is responsible for the ability to use machine tools to finish the surfaces of the babbitt material. The result has not only been greater uniformity, but better character of surface after the job is completed. No matter how proficient a bearing scraper may be, the surface which he provides will not have as high a percentage of bearing contact as a machine finished product. Although not visible to the eye, under the microscope the hand finished bearing is always found to comprise a surface of alternate ridges and valleys which have been produced by the scraping tools. As a result, the shaft bears on the high spots and wears them down at a relatively rapid rate, thereby causing a rather quick initial change in the clearance of the bearing. Furthermore, wear will vary in different bearings, and soon all of the crankshaft main bearings have different fits, even though they apparently were fairly uniform when the engine was first assembled.

Methods Not Used for Service Work

Methods used in fitting new shafts cannot be utilized in service work as yet. Unfortunately, while it is possible to install crankshafts originally whose bearing surfaces are within .00025 in., the same conditions do not prevail after from 20,000 to 40,000 miles of service. A new school of engine manufacturers states that the use of uniform, interchangeable service bearings is practicable until the crankshaft has worn .003 in. or more. At this point, a new crankshaft is installed, in addition to a new set of service bearings.

The Oakland Motor Car Co. has been following this procedure for more than a year and a half and finds it satisfactory. The charge for new crankshafts is $45 and the charge for a new set of bearings is about $7, which is somewhat in excess of the cost of truing up the shaft preparatory to the usual servicing operation. Inasmuch as the average shop is not generally fitted to handle such work and, furthermore, since the quality of the work is not always of the best, the manufacturers believe that the replacement method is more economical in the long run.

The average crankshaft will wear about .0025 in. in 25,000 miles. If the interchangeable bearings are made with an initial clearance of .002 in. over the standard crankshaft size, a total clearance of .0045 in. would result whenever new bearings were fitted to the old shaft. This is just about the limit of good practice in bearing clearance and would probably not be recommended. As a shaft is generally out-of-round after it has worn to this extent, it is a question whether it would not be more economical to put in the new shaft and a new set of bearings and thus have a finished job which is just as good as the original product.

Put Load on Manufacturer

This new school of bearing manufacture takes the load off the service station and puts it on the shoulders of the manufacturer. However, it has not as yet spread widely through the industry, although it is being widely discussed at the present time.

Study of methods used by different manufacturers shows that all use extreme care in location, particularly in the location of the center line of the crankshaft as regards parallelism with the center line of the camshaft. This is essential because of the necessity for having the timing gears in proper engagement. Accurate gear center location is one of the most important factors, tending to insure a silent front end drive. The diversity of practice among the different factories may be noted from a few examples drawn from the shops of concerns who have built their own engines for a number of years. All of these concerns have arrived at their methods of main bearing manufacture after a great many years of experience and the differences are particularly noteworthy when that fact is considered.

The H. H. Franklin Mfg. Co. has the following sequence of operations:

1—Rough bore the crankcase casting less the bearing caps.

2—Assemble die cast aluminum caps to crankcase and bore to the proper diameter to receive the babbitt shells.

3—Assemble babbitt shells in crankcase and face them flush with the bearing face. This is a portable milling operation with a fixture which fits on the surface of the casting.

4—Finish bore babbitt to one standard diameter, leaving .003 to .005 in. for the selective reaming operation.

5—Ream each individual bearing to the proper size to fit the individual journal on the crankshaft which is to be assembled in this crankcase.

The reaming machine is a double station machine permitting of the loading and inserting of the proper reamers

in one side while a case on the other side is being reamed. This, of course, requires the accurate measuring of each journal on the crankshaft so that the proper reamer size may be used in each bearing. The basis of this operation is the fact that it is much easier to ream the bearings assembled in the crankcase to any desired size than it is to grind the crankshaft within extremely close limits. An oil clearance for main bearings of .0005 to .00075 in. is allowed over the diameter of each bearing fitted.

Single Point Fly Cutting Tool Used

Fitting of connecting rod bearings is carried out in much the same way except that a single point fly cutting tool is used to make the finishing cut through the bearing. A set of cutter bars covering the complete range of sizes required is maintained, together with a complete set of Martell reamers for the main bearings. Franklin requires a total of 42 shell reamers covering a range of six sizes by quarter-thousandth steps for fitting the seven main bearings and six boring bars for fitting the connecting rod bearings.

With this method of bearing fitting the Franklin company claims to produce bearings which will average between 90 and 95 per cent bearing surface.

The Olds Motor Works also measures by means of micrometer the diameter of each of the bearings on the crankshaft before reaming the main bearings to fit. Practically all the machine operations on the Olds crankcase for the model 47, eight-cylinder engine are located on two dowel pins from the oil pan base. After the crankcase has been completely machined, the bronze backed babbitt bearings are put into place and the crankcase assembly is placed on a line reaming fixture which also locates from the oil pan base and the two dowel pin holes. Both main bearings and camshaft are reamed, the camshaft bearings being reamed to a standard size to accommodate the bronze bearings which are later pressed in. The main bearings are reamed 2.123 in. to 2.124 in., allowing from .003 to .004 to be float reamed by hand to fit the individual clearance of .001 to .0015 in.

The bearings on the model 43-A Olds, which is a four-cylinder engine, are burnished after reaming. They are reamed to .002 in. under size with .010 shims in place. They are then placed on a burnishing machine and the bearings burnished to fit the individual shaft.

The Winton Co. flycuts the bearings. After the shells have been properly bedded into the crankcase, the case is placed in a rigid, accurately machined jig. This jig is practically a duplicate of the jig used for boring the bearings in line with the crankcase. The only difference between the two jigs is the hold down clamps.

Winton Boring Practice

Due to the distortion which occurs while being machined, the crankcase is first placed loosely in the bearing boring jig. The case is then shimmed up so that the crankshaft bearing axis is in place and parallel with the cylinder base surface and the camshaft axis, as well as the accessory shaft, at the proper distance from each. The crankcase is then clamped securely in position and the crankshaft bearings are rough-bored by a bar which is fitted with a series of fly cutters. The fly cutters are spaced on the boring bar so that but one cutter is in operation at a time. The boring bar, fed by a fine pitch screw, is rotated by hand to eliminate the vibration which might be set up by a mechanical drive. This method was adopted after it was determined that the vibration of a mechanical drive resulted in chatter marks on the surface of the bearing.

A finish boring bar is then used in the same jig to size the bores to two or three thousandths over the diameter of the crankshaft. The cutters on the finishing bar are very carefully ground and adjusted to produce a finished bearing of approximately 100 per cent effective area.

The company states that adoption of this method has made it possible to produce a crankshaft bearing installation which fulfills all the requirements of bearing finish in effective area, parallelism and alignment.

It is also asserted that a bearing design which includes shims and oil grooves precludes the use of this method as the fly cutter tends to jump immediately, after passing over a gap of any kind. A continuous, fairly uniform, rough surface is required for the production of a satisfactory finish. In this case the inner edges of the shims are babbitt faced to form an unbroken bearing surface. As a continuous or 100 per cent type of bearing is used in this design, there are no oil grooves.

The same method is employed in finishing the bearings at the lower end of the connecting rod. The jig for this operation corrects any misalignment of the rod and establishes the correct distance between upper and lower rod bearings.

But one hand operation is involved in finish surfacing either main or rod bearings. Fillets between the bore and end flange of each bearing are hand scraped to insure adequate clearance at that point. Incidental to this operation, any slight defects developed in the surfaces swept by the fly cutters are cleaned up by hand spotting. When the crankshaft is installed, a two thousandth shim is removed in order to thoroughly seat the bearing in the cap on the crankshaft.

Hupp Mechanical Drive

A floating coupling between the driving motor and the boring bar enables the Hupp Motor Car Corp. to utilize a mechanical drive for finish boring main bearings. In preparing for the boring operation, the bronze backed, babbitt lined bearing halves are first firmly seated in both crankcase and caps by special clamps. The bearing halves are dowelled while the clamp is in place. This method insures very close contact between the bearing shells and their seats in both caps and case. After the clamps are removed, the projection of the bearing shell above the joint surface between .003 and .010 in. is ground flush on a vertical spindle grinder which was built for this particular operation. The studs are inserted next and the caps assembled in place.

The crankcase is then placed on a special boring machine, being held in position by two clamps. Location is determined by dowels which project into the two reamed holes that are used as locating points for all of the machine operations. The boring bar is fitted with three adjustable fly cutters and is piloted in four adjustable bronze bushings, which insure rigid, accurate support on each side of the three main bearings. The boring bar is driven by an electric motor through a floating coupling at 260 r.p.m. with a feed of 3 in. per min. About .020 in. on the diameter is bored out of the bearing as the result of an approximate .010 in. cut. All bearing sizes are held to a plug gage having a limit of .001 in. and a diameter which is .001 in. greater than the high limit of the crankshaft size. The resultant bearing clearance is .0025 in. Each cap is fitted individually to the crankshaft which is assembled in the motor and is shimmed to a snug burnishing fit. After 3 hr. run on the block and dynamometer test the bearing arrives at its finished condition.

Heavy Burnishing Bar for Finishing

The National Motor Car & Vehicle Corp. uses a heavy burnishing bar to finish bearings. The burnishing bar is driven by an electric motor and reducing gear, rotating very slowly. This operation is performed after the crankcase has been bored and the bearings inserted and aligned by means of a fly cutter bar. The burnishing is not a

cutting operation. The bearings are gradually tightened as the burnishing bar continues to revolve, lubricant being poured on the bar while the process takes place. Care is exercised to prevent an excessive rise in temperature of the bearings as shrinkage would occur after the bar is removed and the bearings cool. The burnishing bar is made .002 in. larger than the crankshaft to allow bearing clearance.

The process of fly cutting and burnishing National connecting rod bearings is practically the same as for the main bearings, although done on a different machine which allows a long row of these bearings to be burnished simultaneously. This company states that it has found a scraped-in bearing is seldom over 70 per cent, allowing for 10 hr. run on the block. With burnished bearings, after running 10 hr., it is possible to show as much as 90 per cent.

Hand Scraping Not Obsolete

It must not be inferred from the experience of the manufacturers cited that hand scraping has become obsolete. Such concerns as Cadillac, Pierce-Arrow, Duesenberg and others continue it. The Pierce-Arrow Motor Co. claims to secure an 85 to 90 per cent bearing by hand scraping. The aluminum crankcase is bored in special fixtures to accurate dimensions and in proper relation to camshaft bearings. Bronze backed bearing shells are carefully seated in the caps and crankcase. The ends of the shells in the caps project .003 in. at the finished joint face of the caps in order to insure practically continuous bearing surface when the caps are drawn down.

After bearings and caps are carefully fitted, the crankcase is mounted in a fixture similar to that used in the previous operation and the babbitt lined bearings are bored and reamed in proper relationship to the previously bored camshaft bearing. This is done to insure accurate timing gear centers. Thereafter the bearings are hand scraped to the individual crankshaft bearings. At this time all burrs are removed. In fitting the Duesenberg bearings, the machine work is arranged to leave .002 in. stock to scrape in for fit. The steps are as follows:

1—The split face of the crankcase is surface ground to a true flat surface.

2—The forged steel caps are first sawed through the split face, one forging making two caps. The split faces are then spotted in on a true surface plate to a practically true surface.

3—The caps are then bored to within 1/16 in. of size on a Warner and Swazey turret lathe equipped with a special holding or chucking fixture for this operation.

4—The caps are then assembled to the crankcase using no shims. The two faces finished as described above form practically a perfect joint.

5—The three main bearings are bored to within 1/64 in. of finish size by a fly cutter bar. The boring bar is supported between each bearing. In this same manner the bores are given a finish cut to within .003 in. in size, ready for reaming.

6—The bearings are reamed to finish size with an allowable plus or minus variation of .001 in. Martell reamers are used for this operation, the reamers being piloted at each bearing in the reaming fixture.

Packard Eliminates Hand Scraping

The crankcase is then ready for the final finish ream. This is done in a special line reaming fixture, using Martell reamers which are piloted at each bearing. In this operation, .008 in. stock is removed. This leaves .002 in. stock to scrape in and fit the crankshaft to at least 75 per cent bearing at a very light tension.

Packard has eliminated hand scraping on its babbitt bearings. In the manufacture of the Packard bearings, the crankshaft bearing caps are first assembled to the case and bored while in place. They are next disassembled and the bearings, which are of the split type, are assembled. The bearings are next rough and finish line reamed, allowing .0025 in. for each operation. The finished size is 1.8765 and is held to plus .0005, minus .0000 in.

Oakland Interchangeable Bearing

Martell reamer bars are used with reamers 2 13/16 in. long manufactured by the Taft Pierce Mfg. Co. Following reamer operations, the crankshaft is installed and checked for fit and thrust clearance. It is ground to 1.875 in., plus .001, minus .000 and polished with Crocus cloth to 1.875 in., plus .0005, minus .0005 in. diameter.

Oakland is making a success of an interchangeable bearing. In this instance the bearing material is cast directly into the bronze back by a low pressure die casting method. It is claimed that this method produces a very dense structure, the density being under control, thereby giving uniformity and also allowing the use of pure tin bond which melts at 610 deg. Fahr. The interchangeable feature is, of course, obtained by accurately machining the bronze back bearing, the crankcase into which it fits and the crankshaft journals.

The bronze back bearing is made of bronze shell 5/32 in. thick, on the bearing side of which is cast 1/32 in. thickness of babbitt metal (S.A.E. Specification No. 11), the total thickness of the bearing being 3/16 in. As compared with the all-babbitt type, superior strength and longer life are claimed for this bearing. It is also claimed to have a greater heat conductivity (66 per cent more) than the plain babbitt bearing which results in cooler operation, in consequence maintaining the lubricating qualities of the oil for a longer period.

This claim of interchangeability may seem unusual to most manufacturers, nevertheless, the fact remains that the method is meeting with commercial success and is particularly convenient from the service standpoint. The garageman has only to take out the worn set of bearings and replace them with a new set. The flat rate service charge is very low because skilled manual labor is not required. From the service standpoint, interchangeability of main and connecting rod bearings is highly desirable. From the manufacturer's standpoint, it is just as desirable if it can be accomplished. A bad job on either main or connecting rod bearings of course will cause undue trouble for the car owner. It would be far better to have a perfectly aligned set of bearings which gave possibly 80 per cent bearing surface than a set of bearings not in line after servicing, even though the original bearings gave a 95 per cent bearing surface.

No Reason for Excessive Clearance

There is no reason why clearances with the interchangeable bearings need be excessive. With proper manufacturing equipment, it is possible to hold main bearing clearances within .0005 in. of the desired standard.

To secure interchangeability, it is of course essential that the crankcases be accurately machined, particularly as regards the bearing seat. The tolerance limits, necessary to insure seating of the bearings, shall in turn not exceed plus or minus .0005 in. This accuracy is a question of tooling in the factory. It calls for an initial expense but is justified by the interchangeability secured and the ease of servicing out in the field. The dealer's service station and the garage are relieved of a considerable investment in tool equipment. Time for service work is reduced and the owner has greater assurance of a uniform job than he would with methods which accomplish results only in proportion to the skill of the individual service station. In other words, the interchangeable bearing puts the problem up to the factory instead of up to the individual ser-

vice station and, consequently, a greater uniformity of results can be expected.

From a production standpoint, the predominating tendency in the majority of the cases cited seems to be toward the full-surface type of bearing in which the surface is prepared by line boring and finally finished by the running-in process. There is considerable variation in the choice of method used to seat the bearing preliminary to the run-in. These methods may be enumerated as:

1. Final boring or reaming by means of a set of graduated reamers or fly-cutters to suit the individual bearings of the crankshaft which is to be assembled in the particular engine.
2. Boring or reaming to a standard size (within close limits) to fit a crankshaft which has been finished with like precision.
3. Boring or reaming to an approximate bearing seat which is finished by a burnishing process.
4. Boring to a diameter which is slightly undersize and finishing by hand scraping.

Manufacturers of the highest priced cars continue the hand scraping process; nevertheless, producers of cars which have excellent reputations are utilizing one or another of the first three methods enumerated. Regardless of the particular means used in seating bearings, thorough provisions have been made to insure bearing alignment and firm seating of the bearing shells in crank case and caps.

The question of interchangeable service bearings has been rather a stumbling block for many years due to the possibility of wear of the crankshaft bearings. It was not considered practical to attempt replacement with a standard size bearing as, after any great mileage, the crankshaft bearing is likely to be undersize or out of round.

In the case mentioned, the high pressure oiling system supplies a medium at slightly worn bearings that prevents knocking and allows satisfactory performance in spite of the increased clearance. However, it is the policy of the Oakland Company to replace the worn crankshaft by a new shaft after wear at the bearings exceeds .0025-.003 in. When the shaft has worn to this extent, the bearings are no longer truly concentric and flat spots prevent uniform fitting.

The real value of any new theory or development may be measured by its commercial application. In the case described, these bearings are provided for replacement purposes in conjunction with a flat-rate service system. It is therefore evident that this manufacturer has carefully studied the possibilities of the method. A further study of the relation of crankshaft finish and hardness as related to the material and finish of the bearing metal may develop greater possibilities in the way of bearings which may be replaced with no further fitting in the service station.

Washington and Oregon Get National Forest Highway Funds

EXPENDITURES totaling $367,250 of national forest highway funds to apply on the construction of over 110 miles of highway in Oregon have just been approved by Secretary of Agriculture Wallace. This money was made available for roads serving national forests and for roads within or adjacent to forests which are of primary importance to States, counties and communities.

Among the projects for which these expenditures were authorized is one in Lincoln County running east from Waldport for nearly 16 miles. This highway is within the Siuslaw National Forest and forms a section of the Alsea River project extending from Waldport to Tidewater Bridge.

An additional $37,500 has been authorized for the Eugene-Florence highway between Rainrock and Blackly in Lane County. The road is within the Siuslaw National Forest and is a part of the State highway system, being one of the important east and west routes through the State.

The sum of $22,500 has been authorized to apply on 8 miles of road in Deschutes County running east from Belknap Springs. State authorities have appropriated a like sum for this project which lies within the Deschutes National Forest and forms a link in one of the State's main east and west highways.

For the stretch of road between Prospect and Crater Lake in Jackson County, a distance of 8½ miles, the sum of $67,500 has been set aside. This appropriation is additional to funds heretofore appropriated by Federal and local authorities for the construction of the 22-mile stretch between Trail and Prospect within the Crater National Forest.

A section of the Coast Highway extending nearly 5 miles from Neskowin to the Siletz River, is also included within the projects.

About 10 miles of the Mt. Hood Loop Highway is to be surfaced at an estimated cost of $75,000, half of which amount has been appropriated from the Federal forest highway funds and half from State funds. This road lies within the Oregon National Forest.

In Douglas County within the Siuslaw National Forest over 3 miles of highway is to be constructed between Mill Creek and Brandy Bar. This road is a section of the Scottsburg-Reedsport highway which forms an east and west connection between the Pacific and Roosevelt highways and is the natural outlet for the Coos Bay district into the Willamette Valley and Portland.

In addition expenditures totaling $210,000 of national forest highway funds for four road-building projects in Washington have just been approved.

One of the projects in question is in Blewett Pass, Kittitas County, where 2½ miles of road will be constructed between Ingles Creek and the boundary of the Wenatchee National Forest.

Another one of the projects is a new bridge on the Olympic Highway across the Bogachiel River in Clallam County, adjacent to the Olympic National Forest, for which purpose expenditures of $50,000 have been authorized.

An additional $50,000 has been approved for the construction of 10 miles of road in Ferry County extending southward from Laurier. This road is adjacent to the Colville National Forest.

A new project called the Randle-Yakima road received an allotment of $50,000. This new road will extend from Randle to a point 3 miles east. It is within Lewis County and serves the Rainier National Forest.

The New Saturation Problem

By Alvan Macauley
President, Packard Motor Car Co.

WHILE the automobile industry has been busy trying to discuss away the problem of "Saturation" and congratulating itself on the record production putting off the imaginary evil day for another year, it has failed to realize a new and very real saturation problem rushing to meet it. Economic saturation for the automobile industry may come next year or it may not come for fifty years—but physical saturation is already here.

What does it matter if there are still plenty of people to buy automobiles if they have no place to use them?

The big cities of the country, and particularly New York, must face this question. Already the men whose overwhelming task it is to struggle with New York's traffic problems are seriously discussing the restriction of automobiles and the limitation of taxicabs. These ideas may sound wildly impossible—but so were branded a number of ideas which have since become law.

Already traffic conditions are forcing voluntary limitation on the use of automobiles. Many suburban residents have stopped bringing their cars into the city; many city owners will not use them at all during certain hours; in the shopping and theatrical district of New York, walking, even in bad weather, is preferred by some to the exasperations of trying to get to destination in a taxicab.

Above all, the problems of public safety cannot be dodged. It is not relevant to blame the jay-walker. It is not relevant to flourish statistics showing that fewer people die in automobile accidents than of measles. It is not relevant to prove that politics and the police department are responsible.

Many remedies have been suggested—some of them promising and logical—even if drastic. A campaign of safety first education; stricter regulation of drivers and the weeding out of incompetents; more traffic police protection; more stringent punishment for offenses—some measure of relief must come along these lines. And it is the duty of the automobile industry and everybody in it to give to serious constructive measures more than lip service. All the technical experience, all the material resources and all the public spirit in the industry must be devoted to these problems.

All suggested measures will be merely temporary—they may alleviate some of the symptoms—they do not go to the root of the difficulty. Perhaps these measures are all that can be offered for New York. Even the proposals to cut new avenues through the city and to build elevated roadways at the cost of many millions—even such relief may serve only for a few years.

But if the difficulties in New York may be almost insuperable, the automobile industry must prepare for similar conditions in the other great and growing cities. There are scores of cities being built up and developed blindly and inevitably into impossible traffic tanglers. Wry-neck corners, break-neck grades, bottle-neck streets—they are being prepared by the hundred for a long list of future casualties. Everything but the license numbers of the cars and the names of the children are picked out.

Repetitions of New York's traffic difficulties can be avoided—and must be. The fundamental traffic problem is the problem of the city plan. Traffic crowding, delays, accidents, high taxes for police purposes and relief streets, high costs of deliveries of food—all these problems and many others can be traced in large measure to the planlessness of our cities.

A few municipal authorities and city planning engineers are studying the unexpected increase of automobile traffic and the provisions which should be made for it. Too few public officials and public bodies realize what is needed. They do not see yet that it is cheaper to plan ahead than to cut new avenues through big buildings or rear bridges many miles long over crowded streets.

It is up to the automobile industry to face this new saturation problem frankly and intelligently and to do all in its power to help plan and build our cities so that our industry can safely and effectively serve them.

Low Operating Cost Is Essential in Commercial Planes

Design should give aerodynamic balance over entire range of flying speeds. Single-engined type preferable. Safety is of primary importance in aircraft built for passenger carrying. Interchangeable parts will facilitate service.

By Archibald Black

AS a general rule, it will be perfectly safe to regard the single engined type as the preferable one for commercial work. Certainly, the twin engined type has little to commend it. Operating cost considerations make it impracticable in commercial use if it is designed to fly with one of its two engines. If not so designed the chances of a forced landing are doubled with only the slight advantage of an increased gliding range to offset this while, at the same time, the control of this type increases the strain on the pilot. For the time being at least, the use of types having multiple engines may be left out of consideration. If they are to be considered at all, however, the three-engined type is, by all means, the most suitable. Three engines make it practicable, from every viewpoint, to continue in level flight with one engine out of service and probably provide a larger margin of safety than does a four-engined type.

As regards size, so far as can be seen at present, the intermediate size, possibly about 400-500 hp., is the most economical if only one pilot is to be provided. If the greater part of the traffic is to be passenger, it may be desirable to provide two pilots to guard against accident through sudden illness or fainting of one or the other. Provision of two pilots would necessitate increasing this economical size. The popular size of machine, as shown by recent trends in design, is about 450 hp. with a capacity of either eight to ten passengers, or about 1800 to 2100 lb. of freight. As will be noted, this type is very close to the writer's "economical size."

Safety is of considerably more importance in commercial designs than in military craft, no matter whether the former are designed for express package or passenger carrying. The general arrangement of the machine should be such that, in event of an accident, passengers are in the safest position. Next in importance is the pilot, then the freight and, last of all, the machine itself.

Requirements for Pilot Location

These requirements would place the pilot forward of the cabin in passenger machines and back of the freight hold in freighters. However, if it is desired to design a convertible machine—and most present commercial machines are supposed to be of this class—the former position should be given preference. Apart from questions of relative safety, the practice of placing the pilot in front of the passengers tends to have a reassuring effect upon the latter, particularly if they can see him. It will also be found that, in most cases, it is possible to provide a better range of vision when the pilot is located well forward. In the case of freight machines, however, difficulty will be found in locating the freight hold over the line of the center of gravity if the pilot is located forward.

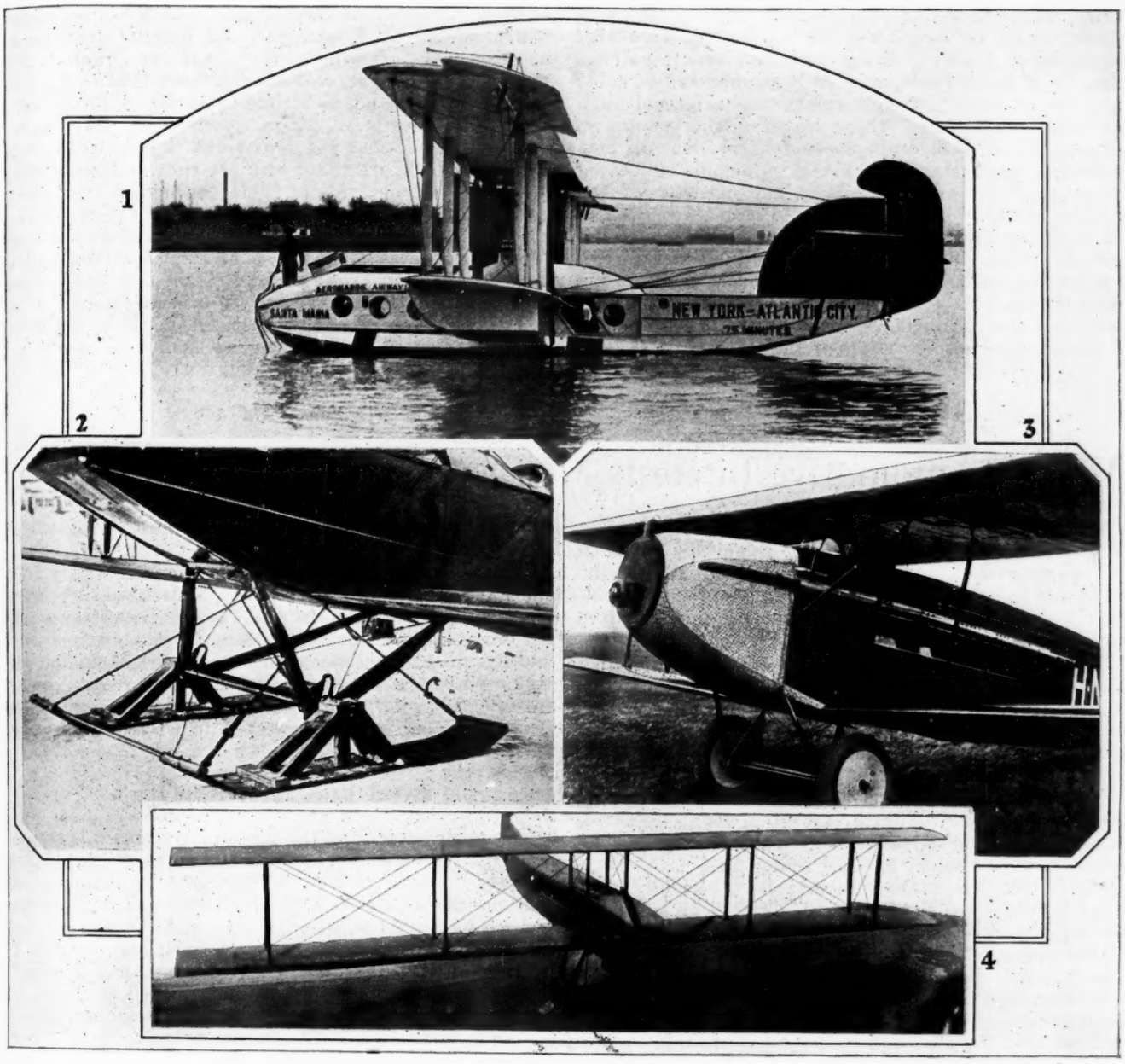
The commercial airplane should be designed so that it is in aerodynamic balance, or nearly so, over the entire range of flying speeds. The pilot's vision should be clear directly forward, this requirement being of more importance in commercial designs than in military work.

Increasing Range of Vision

So far as possible, his range of vision should also extend well downward to each side and upward to some extent, the rearward range being of minor importance. Where the pilot's vision is unavoidably restricted, preference should be given to his vision forward on the right-hand side of the machine. Since approaching aircraft on the same levels and the courses of which cross must always give the right of way to the machine on the right, it is probably more important to provide good vision on this side than on the left. This does not mean that the left side vision can be ignored, however, as the pilot, in overtaking another aircraft, is required to pass to the right, or with the other machine on his left. It will often be found possible to increase the pilot's range of vision by judicious placing of a small mirror, but this arrangement has the disadvantage that such mirrors are liable to become fogged in certain weather.

Simplicity should be aimed for in the design and manufacture of commercial airplanes. Every part which is liable to wear out in service should be easy to replace and inexpensive. All parts must be interchangeable so far as possible. Particular attention must be paid to the ready interchangeability of such major assemblies as the tail, wings, power plant, landing gear, etc. It should be possible to replace any of these as units, a damaged part being replaced by changing the whole unit while the removed unit is repaired later at leisure. In this way the whole airplane is not held out of service while some small repair is made. Most of the recent commercial designs have been provided with a power plant unit which can be quickly removed and replaced as such without dismantling. A single gasoline tank of the gravity type is preferable since it is the simplest possible. It will often be necessary, however, to use other systems. In any case, the wings should be regarded as the preferable location for gasoline tanks, that the danger of fire after an accident may be minimized.

All aileron, rudder and elevator controls should be either balanced or otherwise designed to fatigue the pilot to the least possible extent. Commercial airplanes are usually flown for constant stretches up to four hours and may, in exceptional cases, be flown for two or more stretches totalling eight hours in all. Indeed, the exist-



1—One of the Aeromarine air liners. 2—Snow skids interchangeable with wheels for winter use. 3—The Fokker F-5 which may be used as biplane or monoplane according to the load and speed desired. 4—Farman "Goliath"

ing Konigsberg-Moscow airline of about 750 miles is flown regularly in one day by the same pilot with the same machine. As will be readily appreciated, stiff or unbalanced controls would tire the pilot to the point of danger in everyday use on routes of this kind. To decrease maintenance costs every effort should be made to avoid the use of pulleys and guides in the control cable system. All cables should be straight preferably, other means such as roller chains being used to transmit the motion around bends or turns where these are unavoidable. For reasons of safety, all air controls should be effective when the machine is being landed, with engine cut out, at the stalling speed.

While fabric covering, properly protected against the action of light and moisture, will give about 500 hours of flying service before requiring replacement, this material is by no means satisfactory. Up to the present, however, no thoroughly satisfactory substitute has been found, although plywood, aluminum, composite cloth-and-paper and other materials have been used with some success. The first two have given the most promise and have been used quite widely on commercial designs.

The landing gear should be designed for a very liberal shock absorber movement, 12 in. sometimes being allowed, and the use of some method of damping oscillation is desirable. Tire size should be more liberal than that generally used for the same weight of airplane in military practice. If the machine is to be used for night flights, wing tip searchlights for emergency landing use should be provided. Some method of starting the engine (apart from that of turning the propeller by hand) should be regarded as essential in commercial designs in order to eliminate all possible hazard which would tend to increase operating costs. The engine starter might be of some mechanical or electrical type or might consist simply of a hand crank and gearing.

Following the precedent established in railroad work, the custom of lettering useful information on the body,

wings, etc., is becoming quite general. Among the items which should be so marked for use on the field are: capacities of gasoline, oil and water systems in gallons, capacity of freight compartment in pounds and in cubic feet, size of doors to freight compartment, normal number of passengers and where seated, lifting points on wings, body or tail, drain cocks for gasoline oil, etc., walkways, steps, etc. Such markings should be located where most convenient in use. The capacity of the gasoline system, for example, should be marked close to the filler cap. For most markings on the outside of the body. 2-in. letters are about the most suitable size.

Operating cost must be kept in mind throughout the whole design of a commercial airplane. It is not sufficient that the maintenance cost be low. The time out of service must also be slight if the machine is to be a success. Time out of service represents a capital charge which should be considered. At present airplanes of 400 to 500 hp. carrying eight to ten passengers or 1800 to 2100 lb. of freight, cost about $15,000 to $25,000, without the engines and, as airline operation is yet a highly speculative enterprise, capital charges should be figured at about 15 per cent per annum. It is nothing short of ridiculous to figure these at 6 per cent as is sometimes done. Taking the figure of $20,000 as being a fair one for the cost of a commercial machine bought in small quantities, it will thus be noted that it costs $57.70 per week to merely keep an airplane out of service without allowance for insurance, rent, depreciation and many other important additional charges. In other words, it would be cheaper to operate if the lost time could be cut down even at the cost of requiring an additional mechanic.

French Automotive Interests Menaced by State Alcohol Policy

WITHIN a few days decrees will have been published covering the application of the recent law by which 10 per cent State alcohol must be mixed with all gasoline put on sale in France. The decrees will have to fix the selling price of the alcohol, manner in which it shall be mixed with gasoline, and the guarantees to be given to the public.

The prospect of being obliged to make use of a gasoline-alcohol mixture, erroneously named "National Fuel" for only the 10 per cent alcohol is produced in France, is far from meeting with general approval, and on technical, economical and political grounds the project is being very seriously criticized.

While it has been conclusively proved that alcohol mixtures can be used in internal combustion engines, the uncertainty regarding the proportions of the mixture and the continuity of the supply are disturbing factors.

Official partisans of the mixture have seriously suggested the use of plates bolted to the piston head to get the necessary increase of compression for running on alcohol without apparently realizing the temporary and unsatisfactory nature of such an expedient. Even the Paris Omnibus Company, which for two years has operated one thousand buses on a 50-50 alcohol-benzol mixture, the alcohol being of French origin and the benzol coming from Germany, has not considered it expedient to increase compression, in view of the uncertainty of the supply, although technically an increase was desirable.

The new mixture is not likely to lower the price of fuel in France. The State has a stock of about twenty-five million gallons of alcohol, which was bought at prices varying from 150 to 350 francs per hectolitre, which is more than the retail price for gasoline. Some of this alcohol has been sold to the Paris Omnibus Company at 90 francs per hectolitre, or at a dead loss to the State, and although it is not known at present what prices will be fixed for the 10 per cent alcohol to be turned over to the big distributors, the price is certain to cause a loss to the Government and may slightly increase the price for the buyer.

Claim Distillers Engineer Move

Opponents of the alcohol-gasoline mixture claim that this move is merely a clever attempt on the part of the distillers in the south to get rid of competition by diverting the alcohol produced from beets in the north from human consumption to internal combustion use, to the detriment of the automobile movement. Had America not gone dry and had Germany and Russia continued to buy French wines, the cry "National Fuel" would never have been heard, for the distillers would have been able to sell all they could produce.

The argument that an alcohol mixture is necessary from the standpoint of military security, is declared to be without value in view of the fact that in war time France cannot produce all the alcohol necessary for making explosives, and that in 1917 she was obliged to import 35 million gallons. While the 10 per cent alcohol mixture is expected to arrest the growing gasoline imports, there is a danger that it will necessitate increased imports of sugar and wheat.

Retail Price Needlessly High

The policy adopted by the French Government is responsible for the high retail price of gasoline on the French market. Gasoline received at the port of Rouen at 60 centimes per litre, costs 1 fr. 90c. retail in Paris, for State and local taxes alone are higher than the import price of the fuel. Import duties and transport taxes total 38 centimes a litre, the City of Paris has a local tax of 20 centimes a litre, and the capital immobilized by the necessity of maintaining war stocks of gasoline add another 10 centimes to the price. As an example of the different State policies, gasoline costing 60 centimes per litre retail in Belgium is sold for 1 fr. 50c. in France, minimum price.

FRENCH automobile exports for the first three months of 1923 show an increase compared with the preceding year, the total value being 157,652,000 francs, compared with 112,044,000 francs for 1922. The number of passenger cars exported was 5395, having a value of 139,673,000 francs, and the number of trucks 508, valued at 17,979,000 francs.

Automobile imports show a large increase, the number of cars sent into France from abroad being 2788, valued at 14,219,000 francs, compared with a value of only 4,309,000 francs for the first three months of 1922. The United States headed the list with 2519 automobiles, Italy following with 230, while the number received from other individual countries was insignificant.

The principal countries to which France exported, in the order of their importance, are: Great Britain, Belgium and Luxemburg, Algeria, Spain, Switzerland, French Indo-China, Germany and Japan. The United States received only 24 cars.

Autocar Adds an Electric Truck to Present Line

Places one and two ton models on market. Similar to gasoline type in design and construction. Motor and controller located under seat and are readily accessible. Drives through two piece propeller shaft. Weighs without battery about 4000 lb.

ELECTRIC trucks in one- and two-ton capacities are now being manufactured by the Autocar Co. With the exception of changes made necessary by the substitution of electric for gasoline power, the electric trucks are similar in design and construction to the gasoline trucks manufactured by this company. The axles are identical with those used in the gas truck. This is also true of the brakes and springs.

The driving motor is a straight series type and is located under the driver's seat. It is supported by a heavy cross member which also acts as the front support for the battery. The drive to the rear axle is through a two-piece propeller shaft, which is fitted with three universals. The universal at the forward end of the propeller shaft is of the fabric type. The forward portion of the propeller shaft extends across the space taken up by the gearset in the gas truck. At its rear end this portion is supported in a self-aligning ball bearing which is carried by a cross member. The rear portion of the propeller shaft has metallic universals at either end.

Controller Located Under Seat

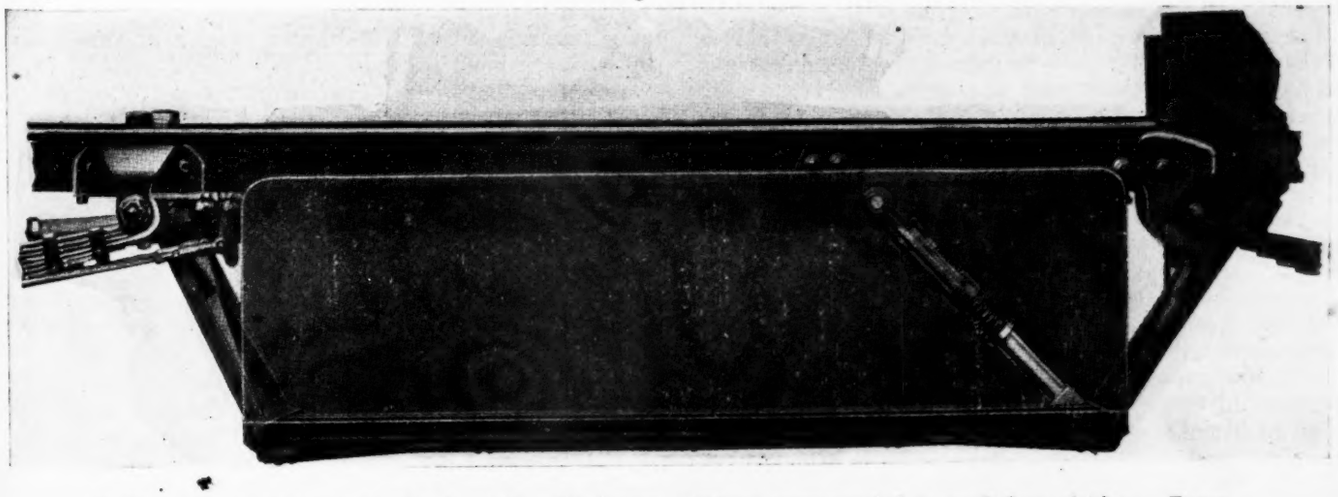
The speed of the truck is controlled by a handle at the left of the driver. This handle operates a drum type controller which, together with the resistances, is located under the seat. The controller gives five speeds forward and two in reverse. In an emergency the motor may be used for braking. The handle operating the charging-running switch is mounted on the steering column just under and ahead of the steering wheel. This handle may be removed when in the off position and it is intended that the driver will remove it when he leaves the truck.

The ampere-hour meter is mounted on the dash and the shunt circuit breaker may also be mounted there if desired. This device opens the charging circuit when the charge is complete. The lighting switch and fuse box are on the center of the dash.

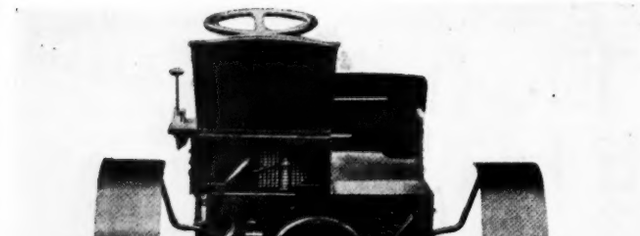
Battery Slung Underneath Frame

The battery is slung underneath the frame in the space between the rear hangers of the front springs and the front hangers of the rear springs. Battery trays are carried on an angle iron platform which is supported by inclined links which are attached to frame cross members at their upper ends. These links are braced against lateral movement. A spring link extends from the center of the front of the battery platform upward and backward to the cross member supporting the center of the propeller shaft. The battery is divided into two parts, one on each side of the propeller shaft. With this construction some longitudinal motion of the battery against the spring link is possible. It is believed that damage to the battery from road shock will be materially reduced in this way.

The battery trays are carried on a single master tray which slides in and out readily. When the master tray is in the out position all the batteries are accessible. It is not necessary to break any electrical connections to



Battery of new Autocar truck is located under frame. Battery trays carried on angle-iron platform. Trays can be moved out without breaking any electrical connection when necessary to get at the battery. Doors on battery boxes serve as locks for trays



Rear view of Autocar electric truck

move the trays out. The doors on the battery boxes serve as locks for the sliding trays.

The location of the motor and controller not only minimizes the amount of wiring, but also makes both units readily accessible for inspection and maintenance. All necessary inspection work can be performed with one tool, a 5/16 cap screw socket wrench. This wrench will release the controller H-plate so that the controller can be turned up into plain sight and within easy reach. It will remove or tighten up all the connector lugs on the controller and running switch. It may also be used to remove the floor boards and cover plates, and to remove or adjust the controller fingers. All wires are run in the open and held with clips and, with the exception of the tail-light, there is no wiring back of the seat. The top of the battery box is waterproof.

These trucks are built in two wheelbase lengths—97 and 120 in. The overall length with the short wheelbase is 156 in. and the length back of the seat is 98 in. On the long wheelbase models these dimensions are 179 in. and 121 in., respectively. The weight of the chassis complete with the exception of the battery is about 4000 lb. The operating voltage is 85 when equipped with lead battery. The one-ton size sells for $2,000 and the two-ton for $2,200. The prices are for the chassis complete with dash, seats and fenders.

All-Metal Airplanes Subsidized by French Government

ALL-METAL airplane construction is encouraged under the latest French subsidy scheme by an increase of 50 per cent in the amount of the purchase subsidy if wood is eliminated from the fuselage and wings. This measure forms part of the new agreement between the French Government and private aerial navigation companies operating under Government control.

The purchase subsidy for public passenger-carrying planes operating to a regular schedule is equal to half the list price of the machine, with a maximum of 600 francs per square meter wing spread and 100 francs per nominal horsepower employed. It is on the figure thus obtained that a 50 per cent increase is added if the plane is of all-metal construction. There is a further increase in the purchase subsidy of 10 per cent if the plane has two groups of engines, 12.5 per cent for three groups, and 15 per cent if it has four groups or more.

The subsidy based on distance covered starts out at 3 francs per kilometer for a useful load of 300 to 350 kilograms, and increases by load 40 centimes for every additional 50 kilos useful load, until, for a useful load of one ton, the subsidy per kilometer flown is 8 frs. 20c. High flying speed is encouraged by an increase of 15 per cent in the subsidy for every increase of 6 miles an hour above a minimum of 93 miles an hour. There is an increase of 10 per cent in the flying subsidy if the machine can maintain its line of flight at an altitude of 3000 feet with one of its engines stopped. When more than four engines are used, two must be shut off to get this subsidy.

Passenger cabins 70 inches in height, with comfortable seats facing forward 20 inches wide, and with back rests 35 inches high, minimum, entitle the operating companies to an addition of 10 per cent on the kilometer subsidy. When a properly equipped baggage cabin is fitted, allowing the ship to be trimmed, an increase of 5 per cent on the flying subsidy is accorded. For wireless equipment there is an increase of 25 centimes per kilometer flown.

In addition to the purchase and flying subsidy, commercial planes operating under this scheme are entitled to a commercial efficiency subsidy which is equal to the fares charged, when these are between 30 and 80 centimes per kilometer. For freight the 100 per cent subsidy is given when the charge per ton is between 4 and 15 francs per kilometer. For newspapers the 100 per cent subsidy is always given, whatever the rates charged.

To get the benefit of State subsidies the planes must be entirely of French construction, the operating staff must be French, and both material and personnel must be under the direct control of the State aeronautical department. In order to be admitted, the plane must climb to an altitude of 13,000 feet in less than one hour with the engine running at one-thirtieth less than its normal number of revolutions.

With a useful load of 660 pounds minimum, crew, fuel for a distance of 300 miles, and a head wind of 32 feet per second it must maintain a coefficient of security fixed by the State, and under these conditions have a minimum speed of 90 miles an hour at ground level. It must take off in less than 980 feet and land in less than 820 feet.

IN its annual report to the Secretary of Commerce the Aeronautical Chamber of Commerce of America made public today the causes for the airplane accidents in 1922, and presented figures to show that the Government must provide air law and exercise jurisdiction over all civil flying if casualties are to be reduced to a minimum.

Stating that the figures were compiled voluntarily by the Aeronautical Chamber in view of the fact that there is no Government bureau authorized to deal with commercial and civil aeronautics, the report indicated that most of the accidents are due to the itinerant pilot who has no fixed base, is unlicensed and unregulated by law, and therefore has no presumptive responsibility.

Financing at Root of Motor Truck Industry Evils

Editor, AUTOMOTIVE INDUSTRIES:

THE motor truck business is a great industry today and is destined to be a much greater one within a few years. The industry is a very modern one—probably we should not go back further than fifteen years to cover its life history.

People who are in no way connected with the truck business imagine, and have imagined for a long time, that because of its wonderful development the manufacturing and selling of motor trucks must be a virtual gold mine and many have clamored to get in and get rich quickly. Behind the screen, we who were in at the beginning have fought and struggled against these men who were dumping in their money and running wild with their mistaken ideas of making a "killing."

They soon discover that their paltry hundred thousand dollars disappeared somewhere in buildings, equipment, salaries and wild advertising. More money must be dumped in to keep the business floating while everybody got busy to place the product in the hands of users by selling, if possible, or giving away, if necessary. In their feverish efforts to get their trucks in service all the known rules of service were cast to the winds. Any man who could be interested was trusted farther than had ever been done before or is now done in any other industry in existence.

The shoe business, grocery, cigars, hardware or any other line that has been with us for a hundred years have not the opportunities to offer one who desires to embark in business. Supposing, as a parallel case, an ordinary laboring man without money or property and with no education or experience were approached by a business man or capitalist with the following proposition:

"Here is an exceptional opportunity for you to go into business for yourself and make a lot of money. I will fit up a nice store with all modern appliances and stock it up completely, pay for your stock, pay your rent, pay your light, water and other assessments. All that I ask of you is that you give me your note or notes, and a mortgage on the stock and fixtures. You do not have to pay me any money until you have earned it and as you sell the stock you may pay a small amount from your profits monthly until it is finally paid for and belongs to you."

This certainly sounds ridiculous and yet we are doing this very thing in the motor truck business today.

I know of motor trucks to the value of $50,000 being delivered in just such a manner and put to work in the hardest possible service which depreciates their value to such an extent that if repossessed at any time after delivery they could not be disposed of at a price that would pay cost of material and labor and other expenses attached to the transaction. Why should a comparatively new business that has required tremendous capital and tremendous effort to establish and perfect the product be reduced to such methods of merchandising?

One would think that a new industry of such vast importance as to revolutionize transportation, would have an advantage over older industries in producing fair returns on money invested and opportunities to those who have labored so strenuously to reap a fair reward, but such has not been the history of the motor truck industry. A few have been able to continue the fight by expending still more money and continuing the struggle while many have been ruined financially and otherwise.

I believe the cause of present conditions may be explained as follows:

This new method of transportation has developed more rapidly than it could be financed and absorbed by what was considered the natural market. There is no good reason why it should have been so, but the natural market generally accepted seems to have been the teaming interests.

Truck salesmen turned to the man who was the leader in this kind of transportation, the team owner and team driver, and as a class their financial ability was and is not equal to the demands. Contractors, builders and draying companies always had depended upon private owners of teams and wagons to supply them with the necessary means of hauling. Equipment was plentiful and the investment small. Transportation of this kind appeared to be adequate and the business of building and road making, as well as moving freight of other kinds, seemed to be satisfactory. Then something happened. The motor car was invented and developed—principally for pleasure. The owners were not satisfied with our roads and agitation all over the country was for more roads and better roads.

It was soon discovered that the new vehicle could be made to haul loads much faster than teams. Rapid development soon demonstrated that motor trucks could also haul decidedly heavier loads. This also created a greater demand for better roads and very soon the motor trucks were demonstrated to be able to build roads as well as to move more freight and to do it faster than horses.

Finally the team owner who had an investment of a few hundred dollars found that he must, if he continued in this line of business, discard horses and purchase trucks, the operation of which he did not understand and which cost thousands as against hundreds invested in his teams.

The correction of present conditions seems to me to be in a demand by the motor truck manufacturers and dealers that entirely new methods of financing be brought about. Motor trucks today are a necessity and the lines of trade which demand trucks must provide a means of paying for them. The builder does not expect to secure his building materials on monthly payments and he cannot build unless he gets these materials to the site. The hauling contractor cannot hope to deliver the building materials with horses in this day and age. Therefore, one or both of these individuals should find a way to finance this necessity. Trucks must be sold and not leased or rented as is virtually the case at this time.

E. C. SHUMARD,
Chief Engineer, U. S. Motor Truck Co.

Exports of Cars, Trucks and Tires for

COUNTRIES	GASOLINE PASSENGER CARS								GASOLINE TRUCKS					
	Up to $500		$500 to $800		$800 to $2000		Over $2000		Up to 1 ton incl.		1 to 2½ tons		Over 2½ tons	
	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value
Europe														
Austria														
Azores and Madeira Islands														
Belgium	585	$245,251	12	$7,970	38	$50,065	19	$41,169	195	$48,908				
Bulgaria														
Czechoslovakia														
Denmark	224	109,573	72	53,404	61	66,975					1	$830		
Esthonia	10	1,833			1	1,283			30	7,857				
Finland	79	22,224			5	4,254			75	17,913				
France	28	12,630	1	636	4	4,891	1	12,000						
Germany														
Gibraltar			1	556	1	1,158								
Greece			5	3,780	2	1,806								
Hungary														
Iceland and Faroe Islands														
Italy							1	2,800	5	1,183				
Latvia	40	11,416							11	2,844				
Lithuania														
Malta, Gozo and Cyprus Is.	8	2,130	2	1,349					4	918				
Netherlands	72	30,596	46	33,229	64	62,325	3	5,533			1	1,875		
Norway	600	193,436	41	26,922	119	118,264			102	32,848	2	2,717		
Poland and Danzig	46	12,524												
Portugal			2	1,267	17	21,579	2	5,987						
Rumania														
Russia	1	300			4	3,700			5	2,488				
Spain	44	17,461	132	94,842	223	263,391	6	16,886	1	824	1	1,088	2	$1,360
Sweden	374	140,087	145	101,287	331	311,953			53	13,692	19	19,202		
Switzerland	34	15,334			25	31,403	7	14,740						
Turkey					1	1,478	1	3,275						
Ukraine									1	453				
England	756	261,960	133	92,895	360	358,083	10	27,489			46	34,790	6	7,500
Scotland														
Ireland			1	800							1	795		
Yugoslavia Albania and Fiume									1	1,200				
North and South America														
United States														
Canada	62	19,501	530	342,300	575	617,185	67	169,399	47	32,795	160	193,666	20	68,366
British Honduras														
Costa Rica			1	550										
Guatemala			8	6,028	6	7,606								
Honduras					3	3,562			1	354				
Nicaragua														
Panama			3	1,937	18	21,234			2	728	1	1,099		
Salvador					2	2,864								
Mexico	517	174,260	143	93,476	165	172,717	7	21,734	46	19,815	4	4,234	3	5,179
Newfoundland and Labrador	1	300			4	4,338								
Barbados	23	8,566			1	822								
Jamaica	41	15,624			17	17,422	1	3,232	5	1,820				
Trinidad and Tobago	26	9,480	7	4,207	3	2,515	1	6,500	5	1,680				
Other British West Indies	8	1,599	1	543	5	5,195			6	1,970				
Cuba	367	101,458	43	30,729	70	84,743	23	59,013	57	15,832	7	7,245		
Dominican Republic	13	5,504			9	11,539	1	2,466	1	350			1	2,765
Dutch West Indies	2	910	1	565	1	1,263			2	614				
French West Indies	1	374			2	1,624			1	364				
Haiti	2	763	12	7,781	3	2,923								
Virgin Islands														
Argentina	121	55,129	54	40,613	219	229,055	6	13,121	5	5,110	10	12,774		
Bolivia					1	812								
Brazil	13	6,109	77	77,173	141	144,187	6	16,776						
Chile	36	11,137	5	3,714	21	24,686	2	5,448	46	18,923	2	3,510	1	3,690
Colombia	32	11,173	15	9,228	6	7,450	3	6,806	3	15,810	7	8,274		
Ecuador			3	1,314	3	3,390								
British Guiana	12	4,564	4	2,460										
Dutch Guiana														
French Guiana	1	374							1	365				
Paraguay														
Peru	5	1,872	2	1,200	2	2,951	1	2,528	3	1,350				
Uruguay	182	57,489	14	7,630	25	28,032	4	11,202	30	7,685				
Venezuela	68	26,997			20	22,593	3	8,193	12	4,540	1	2,070	2	8,138
Asia														
Aden					1	815								
British India	5	2,300	50	34,917	38	40,912			3	3,300	25	27,535		
Ceylon	1	500												
Straits Settlements			16	11,946	28	27,891								
Other British East Indies														
China	2	500	36	26,512	24	24,836			11	3,940				
Chosen	2	873												
Java and Madura	5	2,500	67	44,076	36	39,084								
Other Dutch East Indies			1	798	1	1,124								
French Indo China														
Hejaz, Arabia and Mesopotamia														
Hongkong			1	650	5	4,479								
Japan	231	70,988	25	18,066	54	59,330			229	80,774	4	7,580	13	28,015
Kwantung	1	500					1	2,600						
Palestine and Syria	80	21,306	6	3,173	7	7,928					1	1,068		
Persia														
Philippine Islands	57	20,670	44	31,114	67	70,751	3	7,919	50	17,050				
Siam														
Turkey														
Oceania														
Australia	291	129,126	525	254,262	711	722,953	18	42,229	37	39,758	42	58,357	12	24,811
British Oceania									1	445				
French Oceania	1	250	1	600							1	2,350		
New Zealand	20	8,978	133	87,375	154	168,420	7	16,303	18	18,037	14	20,703	6	13,935
Other Oceania	1	500												
Africa														
British West Africa			2	1,100	12	12,324			12	12,816	12	9,042		
British South Africa	27	13,400	86	62,250	171	166,663	6	13,600	10	10,472	5	5,621		
British East Africa	6	2,652	4	2,351	3	3,098			1	426				
Canary Islands			3	1,650			1	2,466					1	1,693
Egypt	8	3,704												
Algeria and Tunis	3	1,479												
Other French Africa														
Morocco	12	4,493												
Portuguese East Africa					2	2,520			1	1,109				
Other Portuguese Africa			5	3,744										
Spanish Africa					3	3,762								
Italian Africa														
Total	5,187	$1,874,673	2,521	$1,718,999	3,895	$4,080,152	211	$543,447	1,130	$619,360	367	$426,335	67	$170,380

March, 1923 | Canadian Exports

ELECTRIC VEHICLES		PARTS	TIRES						PASSENGER CARS		TRUCKS		PARTS	COUNTRIES
			Casings		Solid		Inner							
No.	Value	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	Value	
														Europe
			260	$4,069			260	$512						Austria
		$700												Azores and Madeira Islands
1	$1,414	313,277	535	12,742			247	684	18	$14,589			$283	Belgium
		170												Bulgaria
		12							2	855				Czechoslovakia
		213,844	8,093	105,189	41	$1,703	6,076	9,645					20,756	Denmark
														Esthonia
		1,967	458	7,160	5	207	346	735					90	Finland
		381,089	1,341	16,815			305	756						France
		542	136	2,598										Germany
									1	1,672				Gibraltar
		91	236	3,353	4	168	50	100						Greece
		36												Hungary
		442	18	300			13	35						Iceland and Faroe Islands
		79,042	1,081	11,259			288	472						Italy
		503	59	1,112			136	225						Latvia
		29												Lithuania
		398											49	Malta, Gozo and Cyprus Is.
		18,260	649	9,151			955	1,152	68	36,387			223	Netherlands
		18,999	4,183	58,856	307	11,057	3,920	8,913	2	1,871			340	Norway
		234												Poland and Danzig
		3,019	587	6,871			110	159	2	2,601				Portugal
		9,658	104	1,398			140	500						Rumania
		1,682												Russia
		30,590	1,246	20,496	415	10,798	506	908	68	67,023			15,438	Spain
1	1,600	28,159	2,955	44,575	11	450	1,824	6,107	52	56,316			1,665	Sweden
		2,825	1,086	16,869			354	823					36	Switzerland
		1,951	205	2,859			22	74					1,779	Turkey
														Ukraine
		381,367	64,121	518,267	2,646	59,663	44,405	47,219	1,337	806,943	7	$9,395	79,602	England
		1,690	1,602	13,975			63	287						Scotland
		41,227	512	5,292			563	669						Ireland
		569												Yugoslavia, Albania and Fiume
									5	3,600			49,273	North and South America
		1,868,597	4,691	89,135	449	16,578	2,991	9,692						United States
		258	35	343			25	34						Canada
		1,158	63	780			40	76						British Honduras
		722	44	1,167			43	137	4	3,852				Costa Rica
		3,021	28	838			19	33						Guatemala
		392	121	1,648			35	63						Honduras
5	6,640	9,252	1,169	14,969	68	1,511	914	1,734						Nicaragua
		94	371	10,149	18	531	333	1,006	3	3,485			87	Panama
		60,590	1,900	27,764	14	1,063	1,917	6,687	1	1,365				Salvador
		9,902	416	5,858			530	1,019					130	Mexico
		1,301	218	1,839	22	469	106	166						Newfoundland and Labrador
		10,924	768	10,248	41	745	576	704						Barbados
		3,326	203	2,484	34	583	103	183						Jamaica
		2,499	87	791	6	89	103	220	18	11,596			111	Trinidad and Tobago
		73,981	5,629	66,713	278	9,553	4,420	8,631	6	4,399				Other British West Indies
		3,618	540	5,895	112	2,835	385	731					161	Cuba
		1,000	208	1,882			271	456						Dominican Republic
		2,250	221	1,802			2	17						Dutch West Indies
		6,252	355	4,460	18	1,038	614	1,179						French West Indies
		421	31	393	10	281	50	102						Haiti
		438,703	17,281	167,630	50	1,667	18,392	28,687	98	85,202			13,059	Virgin Islands
		313	129	1,480			46	77					82	Argentina
		222,906	7,501	67,820	5	274	5,060	6,304	14	16,604			20,455	Bolivia
		19,613	1,522	20,935	64	1,514	2,312	4,984	2	2,758			125	Brazil
		9,919	1,264	15,229	29	446	1,406	2,616	3	2,482				Chile
		517	198	3,268	18	566	100	216	3	3,487			68	Colombia
		716	5	171			157	260	4	2,651			151	Ecuador
		385	22	331			36	72					9	British Guiana
		242												Dutch Guiana
		931												French Guiana
		22,484	902	14,230	41	983	951	2,039						Paraguay
		59,348	1,221	11,049	4	52	755	1,081	18	19,774			396	Peru
		6,746	2,319	24,227	21	1,169	3,589	5,920	5	5,368				Uruguay
														Venezuela
		299	6	369					5	1,442			1,236	Asia
		29,700	3,328	30,033	268	7,103	1,640	2,278	291	124,487	45	15,030	6,606	Aden
		1,457	120	1,245	54	927	250	283	53	20,350			499	British India
		28,303	1,379	13,762	116	2,128	800	1,377	136	59,337	24	8,106	10,977	Ceylon
		245												Straits Settlements
		8,974	311	4,922			114	292	30	23,018			159	Other British East Indies
		1,133												China
		14,258	1,394	22,093	154	3,293	841	1,802						Chosen
		2,165	413	5,654	15	348	306	745	217	77,093			319	Java and Madura
		75	25	290										Other Dutch East Indies
		850	334	3,075			244	341						French Indo China
		1,532	84	738			85	112						Hejaz, Arabia and Mesopotamia
9	16,585	72,529	3,963	50,335	2,034	34,749	2,400	4,291	20	14,769			875	Hongkong
		4,986												Japan
		3,745	211	2,212			256	383					38	Kwantung
		92												Palestine and Syria
		9,636	9,283	75,157	657	14,229	5,726	13,228						Persia
		189	178	1,785	2	30	97	230	12	3,684	15	5,010	17	Philippine Islands
			3	338	4	172	8	65						Siam
		144,185	7,761	109,927	1,801	45,014	3,670	8,072	2,801	1,195,339	656	218,608	103,035	Turkey
		508	45	623										Oceania
		390	32	457			28	55					290	Australia
		47,554	10,592	131,917	574	19,166	4,646	11,811	466	255,872	30	10,020	21,425	British Oceania
		911	68	658			20	37						French Oceania
														New Zealand
		3,372	246	5,147			150	359	4	1,378			776	Other Oceania
		21,965	9,685	98,221	68	1,681	4,800	8,079	633	287,200	106	35,576	9,624	Africa
		2,306	975	8,978			495	835	20	6,651			3,682	British West Africa
		870	126	1,505	46	1,036	127	574						British South Africa
		3,258	833	7,006			38	61	2	1,483			30	British East Africa
		506												Canary Islands
		73												Egypt
		2,468	139	2,213	52	1,382	274	691						Algeria and Tunis
		494	2	30			4	11						Other French Africa
		406					228	525						Morocco
														Portuguese East Africa
		377							2	1,932			22	Other Portuguese Africa
														Spanish Africa
														Italian Africa
16	$26,239	$4,780,570	190,468	$2,017,424	10,576	$257,251	134,141	$221,429	6,426	$3,228,915	883	$301,745	$363,978	Total

Higher Wage Rates Must Be Offset by Reduction of Overhead

Problem before manufacturer is to lower unit cost of production. Labor charges do not deflate. Factory operations still subject to improvement. More attention should be given to study of indirect expenses. Immigration not a solution.

By Harry Tipper

THE definite understanding that wage rates do not deflate is being reached gradually in the manufacturing fields in this country. It is logical that wage rates should make their own standard and this would be understood if more consideration were given to the matter.

All values are based on labor originally, as Dr. Grimshaw said before a gathering of economists some years ago; the only value is labor, and the value of everything is measured according to the amount of time and effort required to discover, extract, produce, manufacture, distribute and handle the products of the soil and all manufactured commodities.

In the complication of modern industry the fundamental importance of this fact is overlooked, because the direct labor and even the total labor is not by any means the entire cost to that manufacturer. Furthermore, the price he can secure for his goods is not always in accordance with the cost of the operations upon it. These do not alter the statement, however; they modify its application.

Labor rates are not subject to inflation or deflation in the same way as are commodities, regardless of the occasional incidents which appear to evidence the contrary.

HOW is the rising labor wage rate to be offset so that manufacturers can continue to do a profitable business? Can labor be deflated and if so will it bring the desired result? These are questions now before the manufacturer which can only be answered after close analysis.

In this article Harry Tipper outlines the fundamentals of the labor wage problem and shows what may be expected in the future. He points out to the manufacturer that the only solution lies in studying indirect costs and reducing factory overhead.

Labor is the basis of all other values, therefore, in the mass the cost of labor is the fundamental basis for the change in other values. This is not, however, the labor rate, but the actual cost of the work, and for many years industry was able to meet the rising wage rate by improvements in organization, equipment and machinery, so that the actual cost of the work was lowered from time to time, even when the rates were rising.

It is well to remind ourselves, however, of the fact that fundamentally changes in prices of commodities are caused by the changes in costs and that labor as the fundamental value is likely to cause changes in the prices of commodities, rather than be subject itself to such changes.

Of course the labor required for any particular group in industry varies, and such group is subject to small fluctuations from time to time, so that the base rate is not always going up. Over any considerable period, however, the tendency is for wage rates to rise regularly and generally. Since the Civil War wage rates have risen almost continuously. During the years of greatest immigration the increases were least and during other years the changes were greater.

Immigration Does Not Lower Wage Rates

After the rate has been generally established on a higher plane, depressions may cause general unemployment without disturbing the rate or resulting in any decrease of more than negligible amount and extremely temporary in character.

The same thing has been witnessed during the years from nineteen-twenty to twenty-three. The wage rates rose very rapidly during the war and afterward. There were many predictions that labor would have to deflate and many very optimistic statements were made as to the probability of the fact and the extent of its movement. Yet in less than two years the small decreases disappeared and the wages were back again at the price of nineteen-twenty. As the situation eases off the volume of business experienced during the last six months, manufacturers are beginning to talk about the wage rates again and express the hope that some deflation will be secured. This, of course, is at the back of the talk about immigration and the necessity for enlarging it. However, it should be observed that immigration did not lower wage rates, although it has operated to check the rise for a time.

Immigration will not operate to lower the rates to any material extent and then only over limited periods. The worker will continue to suffer a considerable degree of unemployment before submitting to a change in the rates of pay and he will probably succeed in maintaining his position as much as he has done in the past, because, after all, labor of all kinds is the maker of values and not the subordinate to them.

For a good many years the changes in labor rates did not affect prices of commodities, because of the introduction of better mechanical methods, appliances and processes, which enabled the manufacturer and producer to use the higher priced labor to better advantage. Up to

a few years before the war this was a continual process, so that the prices of commodities tended to go down while wages were increasing in their rates.

The government of costs will be brought about in the future very much the same way. A manufacturer in one of the large industrial groups, one that has a long history behind it, remarked the other day that he had told his plant superintendents they would have to be content with a smaller manufacturing profit for some years to come unless they could find new organization means of reducing the cost of production. He figured that the public would not pay a price which included the manufacturing and distributing profit they had been accustomed to depend on and he saw no way of deflating labor other than better organization methods and equipment.

Another authority added that the idea of labor rate reductions was of no value, and that there were just two methods of meeting the situation, better manufacturing methods and better distributing methods, so that the labor would be more effectively used.

For the last two or three years prices have fluctuated over a much wider range than costs. It is obvious that prices must in the long run tend to preserve some parity with costs. The volume market depends, however, upon price to a very considerable extent, so that profit will be cut or improvements will have to be made.

As it stands at present there is a very general complaint that the volume secured is not yielding the profit it should to give a satisfactory margin to the manufacturer and the corporation stockholder. Fortunately there are many elements of the manufacturing operations that are still subject to considerable improvement and study given to these matters will yield a handsome return without involving the management in long and difficult controversies with the workers.

One case indicating this occurred with a corporation that had not paid any dividends in the prosperous years of nineteen and twenty. New management was employed in this concern, at the beginning of twenty-one, with the result that in one of the worst years in the history of American business this outfit not only paid its expenses but managed to make enough money to pay a small dividend to the stockholders. No new investments were made in equipment, nor was a large amount of capital employed, except to clear up the left-over inventories from the other period; the job was one of better management and a full accord all down the line as to the thing to be done and the necessity for doing it.

Possibilities in Better Management

This achievement is quite remarkable and indicates the possibilities that lie in keener management in meeting the situation. It is particularly interesting, as the benefit came mostly out of the area of indirect costs so usually classed loosely as "overhead."

It seems absurd to have the direct costs in the factory worked out so thoroughly that they can be checked on any job to four or five decimals and then to determine the overhead by an argument as to the percentage which should be "allowed" on that particular job, because the indirect costs have not been the subject of that same cost examination and their allotment and analysis are still very nebulous.

Among these indirect costs are included the wastes from labor turnover, controversies, strikes, neglect of the man factor in the arrangement and development of the mechanical equipment, and the growth of systems without much regard to the object of their existence and the logical demand of their place within the organization.

Some of these wastes would be eliminated without any very great amount of trouble if we would keep before our minds all the time some of the fundamentals that govern all industrial organization. At all times it is necessary to keep in mind the fact that labor is the fundamental value in all industry and that the entire organization of industry is justified only as it enables the worker to do a more effective piece of work with less consumption of time and effort. Every direct and indirect element in the factory organization is of importance only to that extent and every failure to accomplish it is a failure of organization, which has no other purpose in its existence.

Viewed in this way all systems and methods, all routine necessities are of value only to the extent that they secure order in the work, more effective concentration on the work, and a greater degree of the necessary uniformity, quality and diversity of the product.

"LABOR is the fundamental value in all industry and the entire organization of industry is justified only as it enables the worker to do a more effective piece of work with less consumption of time and effort. Every direct and indirect element in the factory organization is of importance only to that extent and every failure to accomplish it is a failure of organization, which has no other purpose in its existence.

"Viewed in this way, all systems and methods, all routine necessities are of value only to the extent that they secure order in the work, more effective concentration on the work and a greater degree of the necessary uniformity, quality and diversity of the product."

The inspection department is not developed for the purpose of conducting a critical examination of the shop work or securing a meticulous agreement with a set of blue prints. It is placed there to see that the practical and substantial quality which is the standard offered by the manufacturer to the customer is maintained with the least expense and disturbance to the operations. This is lost sight of from time to time and the department may get an idea that it is a separate entity, not an auxiliary to the maintenance of orderly standards of product. All indirect costs of organization demand a constant analysis on this basis, so that the value of and reason for their existence is not forgotten and their incentive for maximum efficiency is maintained.

In all manufacturing work the "overhead" is a worthwhile place for a lot of intelligent analytical work. Its costs have been accepted too easily and its necessity determined without rigorous consideration of the exact contribution to order and efficiency in product.

The only deflation of labor will be an improvement in the process and organization due to more efficient management, just as the past history records.

A BROCHURE on tractor costs as to depreciation, fuel, repairs, upkeep, interest and lubricating oil, has been compiled by the Department of Agriculture, known as Farmers' bulletin 1297. Copies may be had upon request to the department.

Other costs, shown in the booklet, making up the total cost are: labor in repairing and attending the tractor, housing, grease, taxes and insurance.

AUTOMOTIVE INDUSTRIES
The AUTOMOBILE
Reg. U. S. Pat. Off.

PUBLISHED WEEKLY
Copyright 1923 by The Class Journal Co.

Vol. XLVIII Thursday, June 7, 1923 No. 23

THE CLASS JOURNAL COMPANY
Horace M. Swetland, President
W. I. Ralph, Vice-President E. M. Corey, Treasurer
A. B. Swetland, General Manager
David Beecroft, Directing Editor
U. P. C. Building, 239 West 39th Street, New York City

BUSINESS DEPARTMENT
Harry Tipper, Manager

EDITORIAL
James Dalton, Editor
Norman G. Shidle, Managing Editor
P. M. Heldt, Engineering Editor
Herbert Chase, Engineering Editor

DETROIT OFFICE
J. Edward Schipper
WASHINGTON OFFICE
26 Jackson Place, N. W.

BRANCH OFFICES
Chicago—Mallers Bldg., 59 East Madison St., Phone Randolph 6960
Detroit—317 Fort Street, West, Phone Main 1351
Cleveland—538-540 Guardian Bldg., Phone Main 6432
Philadelphia—1420-1422 Widener Bldg., Phone Locust 5189
Indianapolis—1212 Merchants Bank Bldg., Phone Circle 8426

Cable Address.....Autoland, New York
Long Distance Telephone.....PENnsylvania 0080, New York

United States and Mexico.....One Year, $3.00
Extra postage west of the Mississippi River on account of Zone Postage Law 0.50
Canada .....One Year, 5.00
Foreign Countries .....One Year, 6.00
To Subscribers—Do not send money by ordinary mail. Remit by Draft, Post-Office or Express Money Order or Register your letter.

Owned by United Publishers Corporation, Address 239 West 39th St., New York; H. M. Swetland, President; Charles G. Phillips, Vice-President; A. C. Pearson, Treasurer; Fritz J. Frank, Secretary.
Entered as second-class matter Jan. 2, 1903, at the post-office at New York, New York, under the Act of March 3, 1879.
Member of Associated Business Papers, Inc.
Member of the Audit Bureau of Circulations.
Automotive Industries—The Automobile is a consolidation of The Automobile (monthly) and the Motor Review (weekly), May 1902, Dealer and Repairman (monthly), October, 1903, and the Automobile Magazine (monthly) July, 1907.

Boomerang Railroad Propaganda

RAILROADS seem much perturbed by "the current unwarranted attacks" upon them "by radicals and extremists which are designed to reach their climax by the opening of the next session of Congress."

Some of the means they are taking to thwart these "attacks" are likely to have a boomerang effect, however. Some of the New York banks, for example, are mailing with their monthly statements to depositors a circular letter signed by A. H. Smith, president of the New York Central lines, in which he bespeaks assistance in "upholding American principles and institutions."

Specifically, Smith asks the recipients of his circulars to communicate with their Senator and Congressman in opposition to any amendment of the transportation act "or the imposition of further hampering restrictions upon the railroads." Presumably he voices the attitude of the other carriers and it is probable they are worried chiefly about the definition of what constitutes a fair return upon the investment.

Railroads have done a great deal of talking recently about "hampering restrictions," but they seem to have great difficulty in dragging out into the open any of the "hampers" to which they refer.

No one begrudges the railroads a fair profit and industry is practically unanimous in its opposition to Government ownership or operation, provided the carriers can give an efficient transportation service. The railroads have done little to make themselves loved, however. The affection of the people generally would be enhanced if they would work more and talk less.

What the country wants is adequate means of transportation. If the present operators can give it everyone will be delighted. If they can't, someone must be found who can.

When Foul Exhausts Menace Health

FOUL air, produced by contamination of exhaust gas containing unburned products of combustion, is exceedingly difficult to avoid entirely where motor vehicles are used. It has been known for many years that the exhaust from automotive engines frequently contains considerable carbon monoxide, an exceedingly poisonous gas, and deaths have been caused by running such engines in confined space without proper provision for ventilation.

One New York health organization is giving serious consideration to means for preventing carbon monoxide poisoning. Health authorities and others should have the cooperation of automotive manufacturers and engineers in preventing, so far as possible, whatever menace to health is involved in exhaust fumes.

One frequently sees vehicles during acceleration emitting black smoke which is, of course, the result of an over-rich mixture, doubtless occasioned by improper carbureter setting or bad intake manifold conditions.

It appears to be impossible always to secure complete combustion, together with good acceleration and generally satisfactory operations, but, undoubtedly, much can be done to better present conditions.

Some needed improvements will require changes in design and others only reasonable care in adjustment, but steps should be taken, if possible, to prevent an excessively rich mixture. Such adjustment is easily possible with some carbureter designs and, sometimes, even necessary for satisfactory operation, owing to poor design in the manifold or elsewhere.

It will not do for manufacturers to permanently ignore this situation. Unless they cooperate toward the abatement of the present nuisance and possible menace to health, stringent regulations ultimately will compel them to bring about improved conditions, in the meantime hampering the sale of their product.

The problem is not serious in most localities at the present time, but the fact that it is already being given consideration by health authorities is sufficient indication that it cannot be indefinitely thrust aside.

Manufacturers at least can impress upon their service organizations the need for helping customers to keep carbureters and engines in proper adjustment, but the service department cannot get far without close cooperation from the engineering department in establishing conditions which will minimize the use of excessively rich mixtures and consequent incomplete combustion.

The rapid increase in traffic density in cities, and the coming of such public necessities as the New York and New Jersey vehicular tunnel, will make this question more important from year to year.

Competitive Market Needs Salesman

WHILE competition for dealers has been exceedingly keen for more than a year, sales managers of automobile factories have not had to concern themselves seriously about the volume of retail business. Until very recently output rather than demand has been the limiting factor in sales.

With business slowing up, particularly in the open car field, the industry is confronted with a genuine need for real salesmanship. A good many of the order takers in both the wholesale and retail ends of the industry were eliminated in the hectic battle to keep the wolf from the door which followed the bursting of the bubble in 1920. The demand for motor vehicles has been so insatiable in the past year, however, that little more than order taking has been necessary, especially if the dealer was disposed to be liberal in his allowances on used cars.

It has been conceded for some time that the industry had entered an era of fierce competition, but the struggle has been as ladylike as an ice cream festival on the church lawn compared to what it will be as soon as the possible output of motor cars exceeds the actual demand.

The slowing up in general business in the past month has been entirely wholesome. It has averted, for the present at least, the danger of runaway markets and other speculative tendencies.

The country is no less prosperous than it was 6 or 8 weeks ago and its consumptive power has not shrunk seriously. There has been heavy over-production in only a few lines. Markets for commodities and manufactured products are good and will remain good unless there is some unexpected economic convulsion.

The keen edge of the public's buying appetite has been worn off and purchases hereafter will be made on a more discriminating basis. Demand on a large scale still exists, but it must be cultivated. Price promises to have considerable influence on sales the remainder of the year.

Because of changed conditions retail merchants in the automotive field must exert greater effort than has been necessary in the past 12 months if they are to keep the volume of their sales from declining seriously. Factory sales managers who give their dealers the most practical assistance will be the ones who win the greatest measure of success.

With used cars backing up, with a distinct easing in the market for open models, and with deliveries of closed cars far behind current demand, the dealer's path is not an easy one. The factory sales manager who attempts to maintain production schedules by forcing dealers to accept more cars than are readily salable will run afoul of many snags. In the first place dealers are much more independent than they once were and less likely to overstock themselves. In the second place no factory can profit permanently from enforced sales.

Happily there seems little disposition in the factories to proceed along the traditional although outworn lines. Every effort is being made, in most cases, to back up dealer efforts with real salesmanship in advertising, the study of potential markets and other practical assistance.

The acid test for sales ability soon will be applied, and if the factory's product is meritorious, merchandising ability will go farther than anything else to determine who shall live in the long heralded and much dreaded final battle in which only those who are fittest will survive.

Open Cars for Year-Around Service

ONE reason for the growing demand for closed cars is the fact that many open models are either far from being weather tight or are so unsightly and so poorly suited to use in inclement weather that users have turned to the closed models largely to avoid these disadvantages.

Market for closed cars seems certain to increase in spite of their greater first cost, but until manufacturing facilities can be adjusted to the demand, the open car market can be improved by equipping the open body with better fitting, better looking and more easily attached curtains or their equivalent.

There can be no doubt, also, as to the desirability of providing an accessible locker or pocket for curtains not in use and of using lights which do not scratch and which are easily cleaned. The best possible visibility is essential for the driver and desirable for passengers. The car with curtains up should be as smart in appearance as the one without them. Permanent or semi-permanent panels with glass lights are desirable and not difficult or expensive to provide, especially when a non-folding top is employed. A quick opening window which enables the driver to extend his arm is always a convenience.

A heater, adequate to keep the interior of the car at a reasonably comfortable temperature, is an inexpensive piece of equipment which any one who has much driving to do in cold weather will appreciate.

All of these things help to make the open car a year-around vehicle, closely rivaling the closed car in convenience and much easier to sell than an open car in which such details are neglected.

The industry still has much to do toward making passenger cars in general and open cars in particular better year-around vehicles. By so doing it is possible to assure a better winter market and a larger mileage per year, which will react to the manufacturer's advantage and mean more satisfied customers.

SALES FALL OFF IN SOME SECTIONS

REPORTS from various automotive sales centers indicate a slight falling off in actual sales of automobiles in May, this falling off not being regular, however, in all sections. In fact in some of the reports there is a very distinct statement of a larger month than was shown in the previous review of conditions.

Evidently closed cars are still in sufficient demand to keep deliveries below requirements, although in some sections there is a decline in orders for these types because owners are not willing to wait indefinitely for delivery.

In general the month shows good business and offers the prospect of its continuance through June in a very gratifying way. The peak of the demand is past, but the orders on hand and the prospects of sales do not warrant any fear as to the immediate market. The summer should be a good one from the retailers' point of view, and the year has been so good up to the present from the manufacturers' standpoint that the small reduction in orders does not dim the value of the year.

The used car situation is not so good as new car sales would suggest. In some sections used cars are selling as well as they did and better, but from most of the reports it is evident that dealers are finding it a more difficult matter to get rid of used cars. There is a backing up which is likely to affect the dealers' viewpoint on the new cars.

A period of quiet for new cars during the hot months would be a good thing, as it would permit the concentration of energies on used cars and the sale of the cars on hand of this kind so that the necessary trades for fall buying could be made without involving the dealer in a lot of unprofitable inventory.

There are some indications of a larger number of time sales and a smaller number of cash buyers. This is likely to be the case on account of the very large business of the last few months and the character of the market which will offer the dealer his opportunities for the next period.

It is probable that sales are gradually going into a summer decline, which will not be great enough to have any detrimental effect on the business, but which will offer an opportunity to get things cleaned up for the fall. The credit situation will need consideration as the season advances and the used car decline should be followed carefully as an indication of the possibility of a future drop in new car buying, unless it can be cleared away before the fall begins.

The situation from the cost standpoint is better, raw materials have taken a decided drop from their previous high position, and the further slight recessions in some of the metal trades prices give hope of a further drop, although of small extent. The manufacturing profit is still a little short in proportion to the volume, but the easing off of the prices in the more important materials will give a little more area between the cost and the sales price.

Conditions in chief distributing centers as reported by correspondents of AUTOMOTIVE INDUSTRIES are as follows.

Dealers in Leading Cities Experience Closed Car Shortage

Chicago

CHICAGO, June 5—A gradual tapering off in automobile sales in Chicago, which has been in evidence for two or three weeks, became slightly more pronounced last week. The situation, however, cannot properly be described as a slump, and the closing days of the week showed a notable upward trend.

Closed cars are in good demand, and some dealers still have difficulty in making prompt deliveries. Dealers are concentrating on open car sales, most of their advertising being devoted to these lines. Open cars constitute the greater part of the used car selling, and these are bringing fair prices with moderate demand.

Philadelphia

PHILADELPHIA, June 5—Retail sales of new cars have fallen off slightly since the middle of May, without any marked drop. Deliveries on closed models are still slow, and this fact apparently has affected the demand.

Used cars are moving slowly and some dealers report that they have not made many sales in the last fortnight. More open than closed models are being sold at this time. In some cases where prospective purchasers of closed models had been told they could not get deliveries on new cars, they have purchased high-grade used cars in first-class condition.

New York

NEW YORK, June 5 — The slight downward trend of motor car sales in the Metropolitan district, which first became apparent in the middle of April, continued throughout the entire month of May. Total sales for the month were lower than April.

The warm weather of the past two weeks and a more promising turn in the stock market are credited with giving the last few days of May an upward turn in sales that is expected to continue throughout June. Predictions that June will outstrip April and May in deliveries are being made by many distributors, especially in the lower and medium price classes.

The open car demand, which lagged considerably during the past two months, is showing signs of improvment, and it is upon this that the dealers are pinning their hopes for increased sales in June.

Used car sales are moving along satisfactorily, especially in the medium and lower priced makes. The higher priced used cars have been moving slowly, but there are indications that this market will show considerably more life in June.

Toledo

TOLEDO, June 5—A much more favorable turn has been noticed in sales of open cars in the last week, dealers here report. The coming of warmer weather and dissipation of a feeling that a slump was near has materially aided the selling end of the industry.

While sales fell off about 20 per cent in May it is believed that June will show a good come-back. Dealers are still having difficulty filling the demand for closed models and have few cars ahead of schedule in stock.

The used car market is slower but is looked to show some improvement.

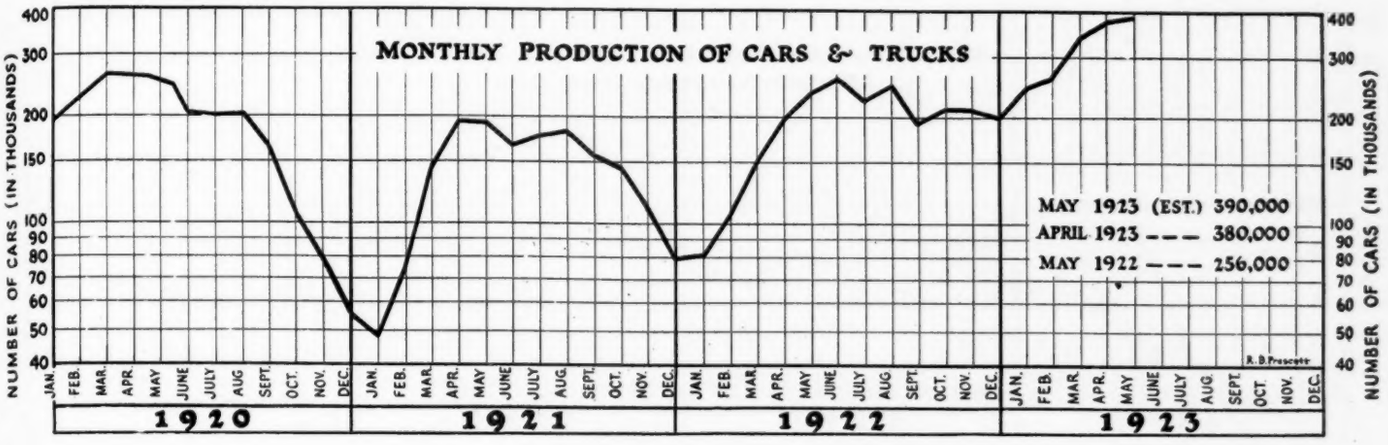
Buffalo

BUFFALO, June 5—The retail automobile business here during May did not quite measure up to expectations, but the falling off was not sufficient to cause dealers serious concern. The call for closed cars was greater and the demand for open models correspondingly less than in May of 1922.

Used cars that are sold right as to price are moving readily. Dealers who have allowed too much on cars taken in exchange are having trouble in getting rid of them.

(*Conditions in other cities on page* 1247)

OUTPUT TOTALED 405,000 LAST MONTH



In First 5 Months This Year 1,659,341 Vehicles Were Built

NEW YORK, June 6—A new peak in the production history of the automotive industry was disclosed with the announcement today by the National Automobile Chamber of Commerce that, according to estimates based on shipping returns compiled by its traffic department, May output reached a total of 405,000 passenger cars and trucks.

This total comes in the nature of a surprise to those who had been watching the returns as made periodically during the month. They had been expecting something like 390,000 or 395,000 at best, a comparatively small increase over April as increases go these days, so that when the final estimate of 405,000 was made it created somewhat of a sensation among members of the Chamber who are here this week for the annual meeting of the organization.

Monthly Average, 331,868

The May count is a new record, replacing the 381,745 established in April and brings the total for the five months of 1923 up to 1,659,341, a monthly average of 331,868 and a daily average of 13,168. For the last twelve months the count is 3,376,214. Compared with May, 1922, there is a difference of 148,781, the total then being 256,219. For the full year of 1922 the production was 2,406,396.

There is every indication that the railroad problem has been straightened out successfully. Carload shipments in May reached a total of 46,100, while driveaways are reported at 60,500. That water transportation is growing in favor is shown by the announcements that boat-load shipments were 12,050 in comparison with 4443 in April and 7406 in May last year.

While the chamber does not segregate passenger cars and trucks in its monthly estimate, it is evident that the builders of commercial vehicles are enjoying the same prosperity as their colleagues in the other branch of the industry. It is figured that at least 10 per cent of the May total were trucks, which would bring the count up to 364,500 passenger cars and 40,500 trucks.

In April the number of passenger cars produced amounted to 344,379 while motor trucks reached a total of 37,366.

May Output of Cars and Trucks Surpassed All Previous Marks in Production History of Automotive Industry

NEW YORK, June 6—Shipping figures compiled by the National Automobile Chamber of Commerce for May give an estimated production of 405,000 cars and trucks, the greatest mark the industry ever recorded.

The following table gives the statistics for January, February, March, April and May and for the months of 1922 and 1923.

	Output		Carloads		Driveaways		Boat	
	1923	1922	1923	1922	1923	1922	1923	1922
January	243,104	91,109	35,228	15,357	30,027	7,479	728	143
February	276,465	122,366	36,147	19,636	43,600	10,173	882	180
March	353,027	172,720	44,350	27,753	62,619	16,917	1,940	560
April	381,745	219,558	46,360	31,334	60,000	22,381	4,443	2,960
May	405,000	256,219	46,100	33,416	60,550	28,827	12,050	7,406

Factory shipments for the other months of 1921 and 1922 and output for 1922 follows:

	Output	Carloads		Driveaways		Boat	
	1922	1921	1922	1921	1922	1921	1922
June	289,011	20,269	34,230	18,834	33,857	3,947	7,737
July	246,607	19,514	29,116	15,533	28,100	3,726	7,030
August	272,589	20,758	32,814	15,218	36,754	3,595	10,096
September	206,849	19,002	25,950	13,840	30,055	2,959	8,002
October	237,611	17,808	26,980	12,971	33,320	2,226	7,040
November	236,887	14,264	27,232	10,528	27,376	1,402	5,070
December	227,319	12,100	26,900	7,500	27,500	134	1,300

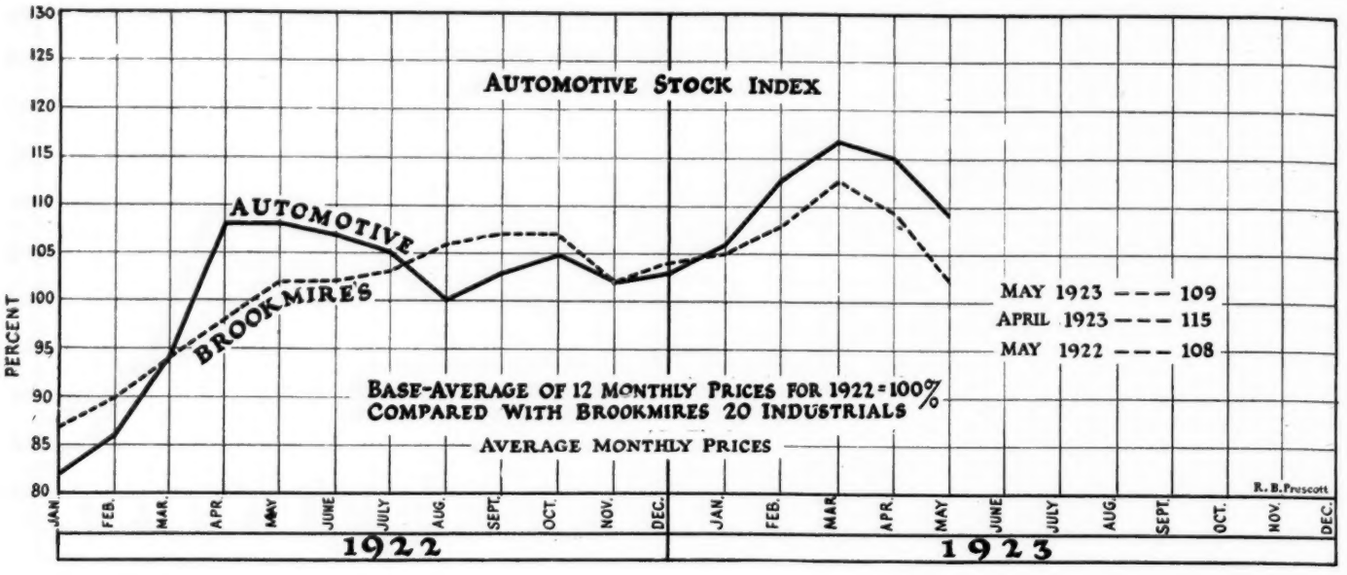
Motor vehicle production segregated as to cars and trucks is as follows:

1922	Cars	Trucks
January	81,693	9,416
February	109,171	13,195
March	152,959	19,761
April	197,216	22,342
May	232,431	23,788
June	263,027	25,984
July	224,770	21,837
August	248,122	25,467
September	187,661	19,188
October	216,099	21,512
November	215,284	21,603
December	207,269	20,050

1923	Cars	Trucks
January	223,706	19,398
February	254,650	21,815
March	318,424	34,603
April	344,379	37,366
May	*364,500	*40,500

*Estimated

AUTOMOTIVE STOCKS MAINTAIN LEAD



Movements of Stocks As Shown by Comparative Quotations

New York Exchange

	May 1	June 5
Ajax Rubber	13¼	11¼
American Bosch	48½	37½
Am. La France	12	11⅞
Am. La France pfd	90	....
Auto Sales pfd	12½	....
J. I. Case	34	....
J. I. Case pf (7)	78	79
Chandler	67¾	60¼
Continental Motors	9¼	9
Electric Stor. Bat	62½	60¾
Emerson-Brantighan	4⅞	3⅛
Fisher Body	162	150
Fisher Body pfd	115	....
Fisher Body rts	16½	....
Fisher Body of Ohio	99	98½
Fisk Tire	12⅝	11½
Gardner Motors	14	10
General Motors	17⅛	14⅝
General Motors pfd	87	83½
General Motors 6%	87¼	83
General Motors 7%	102¾	99⅞
Goodrich, B. F	36	30
Goodrich, B. F	89½	89¼
Goodyear Tire pr. pfd	96⅝	96
Goodyear Tire pfd	60½	54⅛
Gray & Davis	12	....
Hayes Wheel	42⅛	37¼
Hendee Mfg.	18	15
Hudson	27⅞	25
Hupp	26¼	22
Inter. Harvester	88	82
Inter. Harvester	111	....
Kelly-S Tire	57½	45
Kelly-S Tire 6%	85	....
Kelly-S Tire 8%	100	....
Kelsey Wheel	104	103½
Kelsey Wheel pfd	100	....
Keystone Tire	....	6⅝
Lee Rubber	29	24¼
Mack Truck	86½	79⅛
Mack Truck 1st pfd	94	93
Mack Truck 2nd pfd	86	....
Marlin-Rockwell	10	8
Martin-Parry	35	32
Maxwell Motors A	55¼	46
Maxwell Motors B	19	16
Moon Motors	27	26
Mullins Body	23¼	19
Mullins Body pfd	88⅛	....
Nash Motors	106	97½
Nash Motors pfd. A	98	....
Packard	14¾	12½
Packard pfd	92	91¼
Parish & Bingham	11⅓	11¾
Pierce-Arrow	11½	11⅝
Pierce-Arrow pfd	29	16½
Pierce-Arrow pf pfd	66½	66
Reynolds Spring	27	22
Spicer Mfg.	21½	17¼
Spicer Mfg. pfd	92⅛	....
Stewart-Warner	119¾	89½
Stromberg Carbureter	84	71⅝
Studebaker	121¾	112
Timken R. B	41⅝	38¼
U. S. Rubber	60½	50¼
U. S. Rubber 1st pfd	102½	99⅝
White Motor	54½	51⅝
Willys-Overland	7⅝	6⅝
Willys-Overland pfd	67¼	62¼
Wright Aero	10¼	10½

New York Curb

	May 1	June 5
Cleveland Motors	31¾	....
Durant Motors	53½	51¾
Durant Motors of Ind	....	12
Eaton Axle & Spring	....	26
Ford of Canada	435	440
Goodyear Tire	15¾	14¼
Mercer Motors	....	.74
Motor Wheel	11¼	....
National Motors	1½	....
Peerless Motors	48	41½
Perfection Tire & Rub	....	.75
Reo	18⅞	15⅜
Stutz	18½	16¾
Timken-D Axle	12¾	10½
Willys Corp. 1st pfd	8	7

Boston

	May 1	June 5
Gray & Davis	12½	10
Hood Rubber	58½	....
R & V Motor	1	....

Detroit

	May 1	June 5
Columbia	2⅜	....
Continental	9⅛	9
Edmunds & Jones	29¼	34¾
Federal	28½	....
Ford of Canada	430	436
Hall Lamp	28	....
Hayes Mfg	4	....
Hoover	11¾	....
Michigan Stamping	18⅜	....
Motor Products	103	....
Motor Wheel	12⅛	....
Murray Mfg	22	18¾
Packard com	14¾	12⅜
Packard pfd	92½	....
Paige	23	19
Reo	19	15½
Reynolds Spring pfd	85	....
Timken Axle	13¼	10⅛

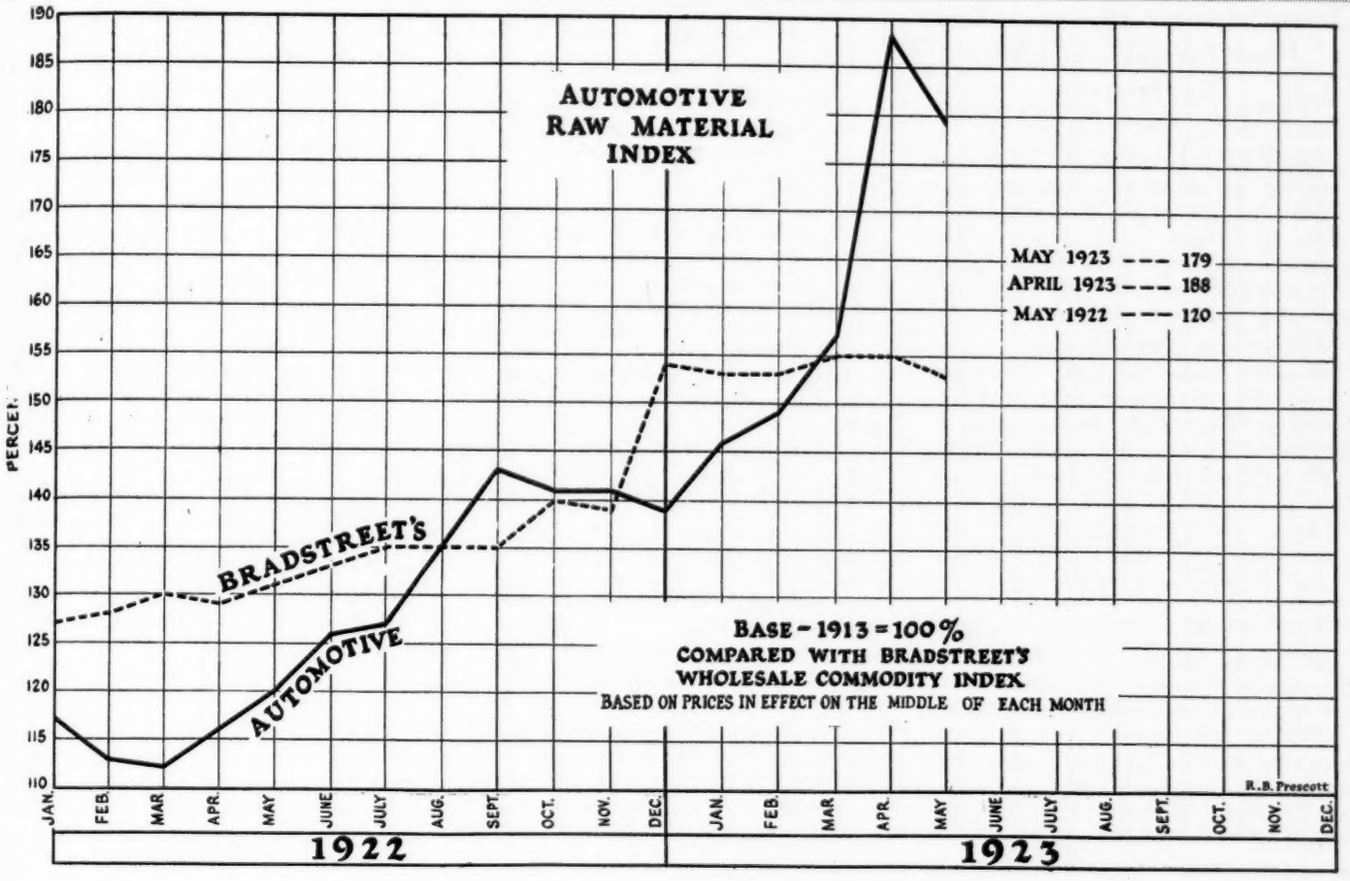
Chicago

	May 1	June 5
Bassick-Alemite	37¾	36¼
Borg & Beck	30⅛	29½
Continental Motors	9¼	....
Earl Motors	⅞	....
Gill Mfg	27½	....
Hayes Wheel	42¼	....
Hupp	26¾	....
Mitchell	¾	....
McQuay-Norris	25	....
Reo	19¼	15½
Stewart-Warner	120½	90⅛
Yellow Mfg	277	264

Cleveland

	May 1	June 5
Goodyear	15⅞	14¼
Goodyear pfd	....	54¼
Jordan pfd	....	26
Miller Rubber	94	....
Miller Rubber pfd	105	103
Peerless Motor	49	42
Stearns, F. B	....	20
Torbensen Axle	30	....

MATERIAL COSTS SHOW SHARP DROP



Weather Conditions Affect Business in Some Territories

Minneapolis

MINNEAPOLIS, June 5 — Weather has been the determining factor in the automobile business in the Northwest. A lull for the last two or three weeks has been charged to the weather, which has been bad for starting farming operations and unfortunate for demonstrators in the cities. With better weather the last week of May, city trade in automobiles has revived. In fact the season seems normal except that June is taking the place of May conditions in ordinary years. Open car sales form a fair proportion of the business.

The used car trade continues good where handled scientifically and where it is considered a part of his regular business by the dealer. Cars are being taken more nearly at real values in trade than, as formerly, at excessive estimates.

Banks in the larger cities of the federal districts report decline in deposits with simultaneous liquidation of some of their investment holdings.

St. Louis

ST. LOUIS, June 5—Weather conditions have retarded sales in the St. Louis territory, but prospects are good for business when the spring season really opens. Used cars are showing a better market.

Dealers expect to move during June and July all the cars that have accumulated through the comparatively poor sales of April and May.

Des Moines

DES MOINES, IOWA, June 5—Conditions in the Des Moines territory during the last ten days have shown a slight improvement over the previous two weeks. Possibly it would be better to state that the slowing down which was noted up to May 20 has been overcome and trade stimulated.

This change substantiates previous statements by Des Moines dealers that any appreciable decline was the result of weather conditions.

Open car weather has arrived in this territory, and during the past ten days there has been an improvement in the sales of that class of car. A better demand on the part of the farmer is also noted by dealers. The market for closed cars, in spite of the improvement in the open car situation, remains abnormal. Des Moines dealers say they expect to see June business exceed that of May.

Indianapolis

INDIANAPOLIS, June 5—May sales of automobiles in the Indianapolis territory were nearly on a par with April, which in turn exceeded the abnormally high marks of March. Although some dealers with higher priced lines experienced a falling off in sales, a large number of dealers in medium and popular priced cars did more business last month than at any time this year. In a few cases May surpassed all previous thirty-day periods.

With the arrival of real summer weather during the last week a noticeable increase in demand for open and sport models has been registered. The majority of dealers and distributors in moderate priced and popular fields expect a better June than the past month, due to open car weather and increased business from the rural sections of this territory.

Used car demand has been good, especially with those distributors and dealers who handle nothing but the better grades of used vehicles. Open models are in good demand. The used car demand in May on the whole was better than that in April.

(*Conditions in Other Cities on Page* 1258)

Longer Month Keeps May Production Up

Manufacturers Devoting More Plant Facilities to Closed Car Operations

NEW YORK, June 4—A greater number of working days in May served to offset the 2 per cent decline in output of cars and trucks reported for the first three weeks of the month. While the total for the first week mounted above that for the same week in April, from then on a falling off in volume of completed automobiles was apparent. This was due in part to greater concentration on the closed type of car, manufacturers finding that in sections of the country a surplus of open models existed while generally there was a shortage of closed cars.

Delay in Seasonal Decline

Seasonal decline both in volume of sales and production has held off remarkably well, major producers following high schedules and retail business running along corresponding levels. Sales conditions today are showing a lack of uniformity, which is to be expected at this time of year, without presenting any phase that would cause concern. With the first five months of the year passing the 1,500,000 output mark by a substantial figure, a new record for that period has been established in the production history of the industry. For the most part this output has had little trouble in finding a ready market.

The general condition of the industry is reflected in the statement of business transacted by the members of the Motor and Accessory Manufacturers' Association for April. Sales that month aggregated $61,647,050, an increase of 4 per cent over March. A steady increase in business is shown since December of last year, collections during these months maintaining an excellent average.

Parts Business Good

Parts makers report that business is continuing good with most plants assured capacity operations until the middle of June, while a few will carry on at top speed until July 1. Owing to the season, commitments are not running for long periods and this condition is being reflected in the conservative tone of purchasing in this branch of the industry. Operations are being affected somewhat by difficulty in obtaining a sufficient supply of raw and semi-finished material, while the labor shortage is still an important factor in keeping down output that the demand for immediate delivery by car and truck makers warrants.

No new record in production by car makers is expected during June, not only because of the short working month, but also because of the disposition of manufacturers to ease up on their operating schedules. The larger cities are regarded as having passed the peak of their demand for this year and with sales now centered for the greater part in rural communities a wider market is being opened for the disposal of such stock of open cars as have accumulated.

(*Continued on page* 1257)

Business in Brief

NEW YORK, June 7—Only a few weeks ago there was a great deal of discussion relative to the need for putting the brakes on the industrial runaway. There is every indication now that the warning signs displayed by economists and bankers have been heeded to a large extent.

Iron and steel output continues at a fast pace. Production for the first six months of this year will probably be the greatest ever known in the industry. Cancellation of orders has not appeared, but new buying is sluggish and the caution evident in other fields is noticeable. It seems now that business would have been on a sounder basis if the influx of orders of the first of the year had been spread over a longer period.

Reports indicate that winter wheat has made fair progress with a slightly smaller crop than last year in view. Spring wheat will probably show a decline, and the cotton field is reflected in short coverings. Activity in cotton mills has been curtailed further.

Car loadings for the week ending May 19 aggregated 991,797, an increase of 17,266 cars over the week previous. This is the peak loading to date for the year 1923. Merchandise and miscellaneous car loadings decreased.

Unsettled conditions were reflected in last week's stock market. Railroad shares showed increased strength, but industrial stocks developed irregularities. It is evident that the market is marking time. The bond market continues to show a gradually upward tendency.

Makers Seeking End to Open Car Apathy

Urge Special Sales Efforts—Closed Body Supply Factor in June Output

DETROIT, June 2—Production in June will be largely a matter of closed body supply. Major producers have all of the orders on hand for closed models that they can take care of in the month. The open car situation, however, has reached a point where sales are practically at a standstill, and in certain cases factories are sending out letters to dealers urging special sales effort to develop open car business.

Expect Warm Weather to Help

Continued apathy on the part of the public generally to open car models will mean that practically all factories will have to make large reductions in their production schedules. Body builders are working to capacity on closed models and cannot increase output to anything like the immediate demand from car makers. With the appearance of warm weather and with dealer efforts, however, it is expected that open car demand will revive considerably.

Only a short time ago emphasis was placed on closed models and pains were taken to educate the public to the desirability of this type of car. Where the buying then was but a dribble of the total, now it is insatiable and, in middle and high priced cars, dominates the business. To a considerable extent the closed car situation is ascribed to the special effort the dealer has made to push sales.

In the low priced lines the open car continues to hold the larger part of the business with the result that Ford and Chevrolet will continue to build to capacity. Ford reports orders from dealers for June delivery to total 315,000 with production of about 175,000. Chevrolet will build close to 50,000 and Star will produce about 300 daily at Lansing.

Hupp Tests Sales Situation

Leaders in the medium priced field declare June business will approximate May. Hupp, to test out the sales situation throughout the country as concerned its product, told distributors to ignore their early year contract commitments and to place orders for June according to their best estimates, taking into consideration possibly changed conditions. Orders placed on this basis gives the factory 1500 more cars than it can build in June operating at capacity.

Buick, Studebaker and Dodge Brothers will enter June on about the same production basis as followed during May

(*Continued on page* 1257)

All Former Officers Renamed by N.A.C.C.

Col. Clifton Enters Upon His Eleventh Term as President of Chamber

NEW YORK, June 7—No change in the personnel of the executives was made at the annual meeting of the members of the National Automobile Chamber of Commerce, held here today, the Clifton régime being continued.

There were five vacancies on the board brought about through expiring terms, and these were filled by the reelection of those who have sat on the board for the past year.

The administration that was returned to office is made up of Charles Clifton of the Pierce-Arrow Motor Car Co., president; Roy D. Chapin of the Hudson Motor Car Co., vice-president; C. C. Hanch, Lexington Motor Co., second vice-president, representing the passenger car division; Windsor T. White, White Motor Co., second vice-president, representing the motor truck division; A. J. Brosseau, Mack Brothers Motor Car Co., secretary, and H. H. Rice, Cadillac Motor Car Co., treasurer.

Reeves Reappointed

Alfred Reeves was continued as general manager, with James S. Marvin as assistant general manager and S. A. Miles as show manager.

Colonel Clifton starts in on his eleventh term as president of the National Automobile Chamber of Commerce, having been chosen leader in 1913 when the Automobile Board of Trade became the N. A. C. C. In the A. B. of T. he held down the presidency in 1911 and 1912.

Roy Chapin has been second in command since 1918, when he was chosen vice-president after having held the secretaryship for a number of years.

The report of the traffic division on the May output of 405,000 motor vehicles brought about a discussion of the prospects for the immediate future. Many expect the usual seasonal decline, but think that it will not be as severe as in other years; in fact, general satisfaction with the situation was expressed.

Committee Meetings Held

The annual meeting was a two-day session, filled with committee meetings at which matters of importance to the industry were discussed. On Wednesday the old board of directors of the N. A. C. C. met in the morning, while in the afternoon the legislative, motor truck, highways and nominating committees were in session.

Nothing of startling moment came out of the directors' meeting. The gasoline tax was discussed thoroughly, and plans were made to bring it up for discussion by the members at the annual meeting on Thursday. A review of trade conditions was given, it being reported more cars are being sold on time payments than ever before.

The used car business is best in the agricultural Northwest and in the steel districts, the dealers reported, while general improvement in the truck line was reported. Light truck prospects are fair to good, it was stated, and best in the large cities, while heavy trucks have fair prospects. Credit conditions are fair to good, except in the Dakotas.

As is customary, the nominating committee reported at the general meeting of members on Thursday morning, naming Charles Clifton, Windsor T. White, H. M. Jewett, F. J. Haynes and A. H. Swayne to fill expired vacancies on the board. It was not until noon that the new board met.

Discussions of the gasoline tax situation occupied considerable time, and it is evident that this sort of legislation is going to demand the attention of the motoring organizations in general. It is expected that a definite policy will be worked out soon, so that when the next legislatures meet, the industry will be prepared for action.

Export Managers Should Guard Against Glutting Foreign Markets in Summer Months

By H. M. ROBINS,
Director of Foreign Sales of Dodge Brothers.

Detroit, June 6.

THE outlook for automobile business in the export field in the latter half of the year is good; probably fully as good as in the first six months, which have produced considerably more business than other years. There may be some recession in buying in the northern countries of Europe due to seasonal and climatic conditions, but buying in South America, Australia, South Africa and other countries with favorable climates will counterbalance this if economic conditions continue good.

It would be well for export managers at this time to take precautions against a possible glutting of the foreign markets through slowing down in the domestic demand over the summer months. The experience of several years ago should be guarded against carefully, and although the situation at that time was made more serious by the sharp reductions in prices, the surplus of cars piled up in foreign ports presented a difficult problem in itself for dealers.

There is a tendency, if foreign business is good, and factories are faced with a temporary falling off in domestic demand, to divert a large part of production to the foreign fields. This should not be permitted to occur and cars should be shipped only in the quantity that the experience of the export manager leads him to believe can be absorbed readily.

The export market for cars is much more flexible than the domestic market, giving the sales manager in this division a much wider opportunity to place his shipments to advantage. Countries are not interdependent upon each other in the sense that the states are, and, in fact, conditions which tend toward depression in one country may bring about greatly improved conditions in another. Australia in the past year has profited greatly through the success of its wheat crop and the failure of the crop in Russia and the Argentine. Thus Australia has been one of the biggest markets for American cars. It is not difficult for the export manager to fulfil his schedule for the year by placing his cars according to conditions in the widely varying group of countries with which he has to deal.

Up to this time there has been no surplus of cars in any country, due largely to the fact that factories have been taxed to meet domestic demand. In some cases it has been difficult for the export manager to secure his allotment for this reason. Changing conditions may result in the opposite extreme if not guarded against. Because of the splendid condition of Australia and the number of cars it has been absorbing, there is possibility of its market being exhausted through sudden concentration there. In other countries a surplus would probably be slower in accumulating because their position would not warrant heavy shipments.

South America generally is improving slowly. The Argentine and Uruguay have suffered because of crop and market conditions. Chili is showing some improvement after long depression. Brazil is suffering because of the exchange situation.

Service in the foreign field has always been of high order and shows constant improvement. The flat rate service plan is being introduced and is finding favor. There are obstacles in some countries in the form of labor agreements and other causes which make it impracticable at this time. The constantly widening foreign market for cars indicates, however, that service generally is satisfactory.

ROLLS-ROYCE OUTPUT

SPRINGFIELD, MASS., June 5—Continued production at capacity through June at the Rolls-Royce plant is assured, it was said today, owing to the demand holding strong and deliveries failing to keep pace with orders last month. G. E. Doolittle is now in charge of the coach works. George W. Kerr, former manager, remains with the works as consultant. C. O. Beck has succeeded Jules Olivier as head designer.

Indianapolis Plant Bought for New Elgin

Company Shifting Equipment from Argo—Production to Start in Fall

INDIANAPOLIS, June 5—J. H. McDuffee, president and general manager of Elgin Motors, Inc., a corporation formed by stockholders of the old Elgin Motor Car Corp. of Argo, Ill, has announced the selection of Indianapolis as the new home of the Elgin car.

Articles of incorporation, filed with Secretary of State Edward Jackson, by William S. McMasters, a member of the board of directors of the new Elgin company, provide for the issuance of 500,000 shares of stock of no par value.

The buildings of the old Federal Motor Works have been purchased, and equipment and machinery are being shipped in from the old Elgin plant. The newly acquired property consists of three buildings, one of three stories of concrete and steel, another a two-story structure of brick and the third a one-story building of concrete and steel. At one time it was the plant of the Empire company and was bought from the Willys-Overland Co. The total floor space is 100,000 sq. ft. The new factory will have a capacity of fifty cars daily and will employ about 500 men.

The company will begin manufacture of a six-cylinder Elgin in September. McDuffee states that the company bought the name and patents of a new model automobile which was the subject of experiment and development by the engineers of the old company for a period of five years, and this is the car that will be manufactured. It will be sold for less than $1,500.

Brush Brothers, mechanical engineers of Detroit, have been retained as consulting engineers.

Dominion Asbestos Head Figures in Darcoid Co.

NEW YORK, June 5—The Darcoid Co., Inc., has been formed to take over the manufacture and distribution of the packings, mechanical rubber goods and miscellaneous asbestos and rubber products of the Dominion Asbestos & Rubber Corp. of this city.

The latter concern will confine its activities to the manufacture and distribution of Dominion brake lining and the new Dominion shock absorber.

William M. Meek, president of the Dominion corporation, is president and treasurer of the Darcoid Co. William F. McClean, formerly of the Gutta Percha & Rubber Manufacturing Co., is vice-president, and M. Rueger, formerly with the Dominion, is secretary.

SPOKE-END CONTEST FINISHED

DETROIT, June 5—Awards to employees at the Ford Motor Co.'s Hamilton plant for the best suggestion on the use of waste hardwood spoke ends resulted in the first prize being given for the suggestion, distillation, yielding numerous by-products; second prize, use for flooring in the same manner as tile; third prize, wooden mats and floor brushes. Two honorable mentions were given for suggestions of shorter cutting in the rough.

In 6 Months Auto-Lite Will Earn $8 on Common

TOLEDO, June 4—Directors of the Electric Auto-Lite Co., at their meeting, declared a quarterly dividend of $1 a share, payable July 2 to holders of record June 14. C. O. Miniger, president of the company, said of conditions: "We will have built by July 1 this year 80 per cent as many Auto-Lite startting, lighting and ignition equipments for motor cars as we built all last year," he declared.

He added that prospects for business for the third quarter are much brighter than the earlier anticipations. The financial statement shows that profit for the first six months will be approximately $2,000,000, which is $8 a share on the 250,000 shares of common stock outstanding. By July 15 the company will have taken up $1,600,000 of its bonds out of a total of $3,000,000 ten-year issue floated a year ago.

New Company in Jackson Will Manufacture Fans

JACKSON, MICH., June 5—The Automotive Fan & Bearing Co. has been organized here for the purpose of manufacturing automotive fans equipped with an internal high pressure oiling system and special bearings. A plant has been obtained, and the installation of production equipment has been practically completed.

Several men, well known in the industry, comprise the officers and directors of the company. They are Harry Foster of the Foster Machine Co., Mort. DeWitt of the Champion Spark Plug Co., T. B. Funk, E. F. Willet and Charles Hollerith.

Lincoln Electric Buys Grant Motor's Property

CLEVELAND, June 6—The Lincoln Electric Co. of this city has purchased from the receivers the property of the Grant Motor Car Corp., paying $426,000 for it.

The purchaser will move from its present quarters shortly to the Grant plant, where it will increase its production of electric motors.

The personal property of Grant will be disposed of at auction within the next thirty days. The service department has already been sold. Since the receiver was appointed last fall only the service and repair departments have been kept open. No passenger cars have been manufactured.

Checker Cab Moving to Kalamazoo Plant

Company Expects to Be in Production of Fifteen Chassis Daily by July 1

KALAMAZOO, MICH., June 5—A production of fifteen chassis a day within the next three weeks is promised by W. L. Kroneberger, sales, service and advertising manager of the Checker Cab Manufacturing Co., which is now moving its equipment from its former plant in Chicago to the local factories of Handley Motors, Inc., and the Dort Motor Car Co., which it recently purchased.

Operations will start in Plant No. 1, as the former Handley factory has been designated, all chassis work to be done there. This building will also be headquarters for the production, engineering, sales, service and advertising departments.

Plant No. 2, the former Dort body plant, will house the body division and the executive and financial offices of the concern. The Checker company has contracts for bodies with makers in Springfield, Mass., and Indianapolis. As soon as these contracts are completed, the local taxicab concern will make all its own bodies.

Robert Gladfelter, who resigned as general manager of the Dort company's body plant, will hold a similar position with Checker Cab and be in charge of production at Plant No. 2.

Moulton Assists Goodspeed

Bert Moulton, formerly of Moulton & Dalgliesh, Studebaker dealers, has gone with the new company as assistant to Leo F. Goodspeed, in charge of production and engineering. He is now engaged in building up an organization. Mechanics are being hired at Plant No. 1, while body builders, painters and upholsterers are being lined up.

"Our program provides for production of completed chassis by June 15," Kroneberger says. "We should be building fifteen a day by July 1. Production will be steadily increased to thirty chassis daily in the fall. Going at full capacity, we will require 500 to 600 hands."

The Checker company was organized three years ago. It now has an authorized capitalization of 30,000 shares of class A common stock, preferred as to dividends up to $5. It also has 75,000 shares of class B, common, no par value. Cash to the amount of $1,250,000 has been paid into the treasury.

ATTERBURY TIRES LARGER

BUFFALO, June 4—Larger tires as standard equipment on all new models are announced by the Atterbury Motor Car Co., maker of Atterbury trucks. On the 1½ to 2-ton model the size is 34 by 4, on the 2½ to 3, it is 36 x 4; on the 3½ to 4, it is 36 x 5, and in the 5 to 6-ton it is 36 x 6.

Trippensee Provides for Greater Output

Newly Expanded Company Will Turn Out Both Open and Closed Bodies

DETROIT, June 4—Capacity of the new Trippensee Closed Body Corp., a merger of the Trippensee Manufacturing Co., and Everitt Bros. Co., will be approximately 200 closed bodies a day and about 100 to 150 open bodies, two plants of the company to be devoted to the building of the body proper, and the former Everitt plant to the finishing, upholstering and painting. The manufacture of the open and closed bodies will be carried on separately in the two plants of the former Trippensee company.

The plants are undergoing considerable remodeling and with new equipment the capacity as outlined above will be in excess of present output, giving the company opportunity to take on new contracts. Until the formation of the new company, the Trippensee company had been mainly engaged in the manufacture of the Rickenbacker bodies, and this will form the nucleus of the new company's businesss.

The complete list of officers shows Frank J. Trippensee, president; R. S. Everitt, vice president; G. D. Everitt, secretary and treasurer, and Walter Serenberg, assistant secretary and controller. The board of directors is headed by Byron J. Oades, as chairman, and includes the three first mentioned officers and Russell G. Finn, Ralph Routier and Arthur J. Stock.

Beacon Tire Co. Agrees to Naming of Receiver

NEW YORK, June 4—David B. Costuma has been appointed receiver for the Beacon Tire Co., of Beacon, N. Y., and the Automobile Tire Co., Inc., of New York City upon application of De Mattia Brothers, a creditor for $9,850 and on consent of the corporations.

The aggregate liabilities are listed at $128,367 and the assets are estimated at about $400,000. The Beacon Tire Co. manufactures Beacon tires, while the Automobile Tire Co., owning the majority of stock in the manufacturing concern, is the distributor with agencies in Albany and Jacksonville, Fla.

Templar Still Has Plan for Six-Cylinder Model

CLEVELAND, June 4—If a proposed reorganization of the Templar Motor Co. is completed, the company will carry out its intentions of producing a six-cylinder model in addition to its four-cylinder and would list it at less than the price of the present Templar.

A statement issued by the reorganization committee contains the argument that the only criticism that is heard against the four-cylinder car is that it is too high priced and the committee feels that by making slight changes it could be made and sold if priced at $1,600.

A survey that has been made discloses that if the plant were to be sold at auction practically nothing would be left to the stockholders, while if a reorganization is effected the plant and good will would be worth from $3,000,000 to $4,000,000.

GRANTS BUS PERMIT WITH RESTRICTION

CAMDEN, N. J., June 4—An unusual restriction was placed on a permit granted to operate a bus line between Camden and Bedford, the Public Utility Commission ruling that the bus owners shall not compete with the railroads on part of the route by accepting passengers who end their trips between the railroad ferries and Twenty-first and Federal Streets.

National Spring Adds "Trainor" to Its Name

NEW CASTLE, IND., June 4—The National Spring Co. of this city hereafter will be known as the Trainor National Spring Co., according to announcement made by Frank Barnett, sales manager.

The company was organized in 1910 to produce passenger car springs. A year or so ago, the replacement springs manufactured by the company were designated as Trainor springs in order to identify them with F. J. Trainor, president of the company.

The change, which has just been made in the firm name, is for the purpose of identifying the company more closely with its replacement product.

Standard Oil Pays Half of Indiana Consumer Tax

INDIANAPOLS, June 1—Standard Oil officials yesterday announced that although the state 2-cent-a-gallon gasoline tax goes into effect today, price of the fuel to the consumers will be advanced but one cent by Standard Oil distributors and stations.

It is expected that the independents will pay the 2-cent gasoline tax to the State, and raise the price to the consumer 1 cent instead of the two that has been expected.

In a statement a short time ago Standard officials announced that they would meet the State and the consumers half way and absorb one-half of the 2-cent tax. The officials at the time they made this statement to Gov. Warren T. McCray said that inasmuch as all the money from this source is to be used for road work the company was in favor of the tax.

Work to Be Started on New Jewett Plant

Completion Set for November 1 and Full Production First of Year

DETROIT, June 4—Work on the new Jewett plant of the Paige-Detroit Motor Car Co. will be started at once, date for completion and occupancy being fixed for about Nov. 1, permitting the company to be prepared for full production about the first of the year. The plant will have a double assembly line with layout for most modern methods of material handling and will have capacity for 500 cars daily.

The erection of the new plant will result in extensive reorganization of present manufacturing plans on both Paige and Jewett models. The company is now occupying three plants in the city, the main factory being given over to Jewett assembly with capacity for about 200 daily, the former plant of Hinkley motors, recently bought, being used exclusively for Paige construction, and the engine plant in which the company builds all its Jewett engines.

When the new factory is constructed the assembly of Jewett will be transferred there, it being within a short distance of the engine plant and favorably situated for receiving and shipping a large volume of materials and finished cars. Paige construction will then be moved back to the present main plant, where the company will have a double assembly line capable of production of from 100 to 200 cars daily. No decision has been reached on the use of the Hinkley plant, but there is a likelihood that the company will build some units now bought.

The company has disposed of all of its former truck inventory and the Paige truck is definitely discontinued. Truck construction was formerly carried on in a part of the engine plant now devoted exclusively to building Jewett motors. The truck material was sold off to individual buyers.

Atlanta Hears That Ford Is Planning Cotton Mill

ATLANTA, June 4—According to information obtained by textile plant engineers in Atlanta, the Ford Motor Co. is seriously considering the establishment in the southeastern field of a plant to be used for the production of cotton drill.

The plant, it is said, will cost around $25,000,000 and contain approximately 300,000 spindles.

HERMAN N. ROBINSON DEAD

MOLINE, ILL., June 5—Herman N. Robinson, who retired as purchasing agent for the Moline Plow two years ago due to ill health after having served in that capacity for 17 years, died at his home here. He was 45 years old.

Advertising Spells Growth, Says Graham

Pays Tribute to "Virile and Constructive Trade Press" at Convention

ATLANTIC CITY, N. J., June 4—George M. Graham, representing the National Automobile Chamber of Commerce at the general session of the Associated Advertising Clubs of the World here today, told the meeting that advertising has been a fundamental of progress in the automobile business, and that the industry uses every type of advertising to some degree. He emphasized the importance of the trade press by saying, "Particularly have we had the invaluable support of a virile and constructive trade press."

After citing statistics of the industry as to production and amount of money involved, Graham, as a member of the Highway Committee of the N. A. C. C., discussed the four outstanding problems of motor transport as brought out by the constantly increasing use of the automobile.

Takes Up Road Problems

Along these lines, he said:

First, we must finance and expand our highway systems to take care of a volume of traffic which is fast outstripping their capacity.

Second, tax and license charges against motor transportation must be so restrained that, while adequate, they must not be restrictive or punitive.

Third, motor transportation must be fitted into its proper relationship with other mediums of transportation, so that the economic needs of the public can best be served.

Fourth, a way must be formed to curtail the number of accidents and fatalities chargeable to the automobile.

There are those who seem to believe that not enough taxation can ever be piled on the automobile, despite the fact that last year in various ways it bore a burden of $35,000,000.

We want to pay our share, but there is a point when over-taxation of any group becomes injustice.

Forty per cent of the cost of construction of the higher type of highways is permanent in character, as for example, drainage and location gradients. Therefore, it seems unreasonable to ask the people of the present decade to meet the entire cost of such construction.

Would Divide Expenditures

Therefore, as general principles, we contend:

(1) That all highway expenditures should be divided, just as railroad expenditures are, into two classes, capital outlay and current expense.

(2) Since capital outlay is a permanent investment it should be paid for from the proceeds of long term bonds, and since highway construction is of benefit to all, the interest and amortization charges of such bonds should be paid for from general taxation.

(3) Current operating expenses naturally include all the costs of keeping these highways in first-class condition. Everybody should pay some part of this maintenance cost through a general system of taxation, but the higher assessments for maintaining the highways should be borne by motor vehicle users and by agricultural and urban property owners whose valuations are enhanced by highway improvements. The proper ratios can be ascertained only by detailed study.

We advocate the most rigorous punishment of offenders and will bend every effort to the support of public activity in this direction. But we do not consider punishment to be nearly as efficient as prevention. Therefore, we are working on an elaborate program of education, which concerns itself particularly with reaching the young.

We have proved that the total of accidents can be reduced. Massachusetts, for example, despite the increasing use of cars, cut down its motor fatalities from 544 in 1921 to 522 in 1922. Connecticut effected a reduction from 235 to 206 in the same period. Thirty other cities lowered their highway mortality.

John A. Wilson, Former A. A. A. President, Dies

FRANKLIN, PA., June 6—John A. Wilson, former president of the American Automobile Association and first cousin of Woodrow Wilson, died here today after a lingering illness, aged seventy-two. Mr. Wilson for years occupied a prominent place in motoring. A vigorous worker in the ranks of the A. A. A., he did much for the cause of good roads, and his connections at Washington were such that he aided materially in Federal aid legislation.

Mr. Wilson, in the early days, did not believe in the claims made for speed of stock cars, and fifteen years ago offered a cup for the first American stock car that could show sixty miles an hour over both ways of a measured mile. No one ever won it. Also he was greatly interested in self starters and at one time bought up many patents on air starters.

Horace E. Dodge Left Estate of $37,186,588

DETROIT, June 6—Inventory of the estate of the late Horace E. Dodge, filed in Probate Court, shows a total estate of $37,186,588. This is slightly in excess of the John F. Dodge estate of $36,892,588.

The bulk of the estate consists of 50,000 shares of Dodge Brothers, Inc., stock, valued at $29,343,350. Mr. Dodge owned Dodge Brothers Realty Co., stock worth slightly over $1,000,000, and ten shares of Ford Motor Co. of England. The Victory and Liberty bonds owned totaled $4,000,000. The rest of the estate was in bank stocks and personal property.

Rickenbacker to Carry $1,000,000 Insurance

DETROIT, June 6—The Rickenbacker Motor Car Co. announces that Lloyds of England will issue a $1,000,000 policy on Capt. E. V. Rickenbacker, covering accident or death while in an airplane, the premium being $5,000 a year.

Rickenbacker, as director of sales, desires to cover the country by airplane.

Winton Joins Haynes in Proposed Merger

Stockholders Agree to Consolidation—Dorris Soon to Take Action

CLEVELAND, June 5—Stockholders of the Winton Company yesterday voted to go into the proposed merger of automobile plants put forward by C. P. Holzderber, representing the Bankers Issue Co. of New York City. Stockholders of the Haynes Automobile Co., Kokomo, Ind., already have voted to go into the merger, and stockholders of the Dorris Motor Co. will act soon.

The Consolidated Motors Corp., capitalized at $19,000,000, will operate the plants. The Winton Company, it is understood, will receive $1,000,000 in cash for its plant and equipment, $250,000 of debentures and 93,000 shares of common stock. The cash would be used to liquidate present indebtedness of Winton and the securities would be disposed of as desired. Present capitalization of Winton includes $1,350,000 of 7 per cent cumulative preferred stock and $1,000,000 of common.

George H. Brown, secretary-treasurer of the Winton Company, said the merger would improve the position of Winton. Through the consolidation all of Winton's obligations would be paid off, and while the automobile plant would be operated under the name of the Consolidated Motors Corp., the Winton Engine Co., maker of marine engines, etc., would retain its corporate identity.

The consolidated company will have $5,000,000 of 7 per cent debenture bonds and 700,000 shares of no par value common stock representing a book value of $20.

Sale of Wills Property Postponed Until June 21

DETROIT, June 5—The sale of the C. H. Wills & Co. property, scheduled for tomorrow, has been adjourned for two weeks following an application to the special master in chancery by counsel representing the reorganization interests. The sale will be held June 21 at Marysville, bidders to deposit checks for $200,000 twenty-four hours in advance.

Reasons for the adjournment were unknown to the receiver, counsel leaving the city following the granting of delay. In the opinion of the receiver, the delay was asked in order to give creditors and bank executives additional time to work out details of the reorganization before the plant is bid in.

No deposits had been filed up to the time the sale was announced adjourned, there being nothing unusual about this, however, as it is customary to qualify in the last few closing minutes. It is considered practically certain that the creditors will buy in the company.

Olds Will Turn Out Copper-Cooled Six

Factory Now Working on It—New Six-Cylinder Water-Cooled Also Announced

LANSING, MICH., June 6—A copper-cooled model will be added to the line of the Olds Motor Works. It is not ready for the market as yet, and the company cannot say definitely when it will be. All that can be released on the subject at the present time is that progress is being made.

While it had been rumored for some time that this addition would be made to the Oldsmobile line, it was not until today that the company made any formal reference to it. It came in the form of the following announcement:

"The Olds Motor Works announces that during September it will put on the market a new popular priced water-cooled six-cylinder car along with its present line, which will be continued into the 1924 sales year.

"Progress is being made on its copper-cooled six, and when that car is ready for the market, it will be offered through the present sales organization, in addition to the new water-cooled six."

Dealer Sells Studebaker Open Car on Weekly Plan

NEWARK, N. J., June 7—A $10 a week payment plan has been put into operation by the Studebaker Sales Corp. of Newark. The plan is applied only to the open models of the Light Six. Under the plan the customer's used car is taken in as the initial or down payment, provided it is worth a reasonable sum. No other cash payment is made, and the balance is paid off at the rate of $10 a week.

The car is covered by insurance for two years, which is the period over which the payments run. Interest and other charges are included in the payments. The plan was devised and is being used only in the northern New Jersey territory covered by the Newark distributors.

General Motors Sales 176,320 First Quarter

NEW YORK, June 5—The combined sales by the car and truck divisions of General Motors Corp. in the first quarter of this year totaled 176,320, compared with 71,031 in the corresponding quarter of 1922, according to an official statement. The sales follow:

	First Quarter	
Passenger Cars:	**1923**	**1922**
Buick	53,289	21,947
Cadillac	6,046	5,410
Chevrolet	100,895	33,369
Oakland	6,096	2,941
Oldsmobile	7,281	3,440
Commercial Cars:		
Chevrolet	575	577
GMC Trucks	1,833	780
Oldsmobile	305	205
Totals:		
Passenger cars	173,607	67,107
Commercial cars	2,713	1,562
Miscellaneous*	.....	2,362
Grand Total	176,320	71,031

* Includes tractors; also cars and trucks not now manufactured.

Sales for May

NEW YORK, June 7—Preliminary combined sales in May of the American and Canadian passenger and commercial car manufacturing divisions of General Motors totaled 74,500 cars and trucks. This compares with preceding months and further with corresponding months of a year ago as follows:

	1923	1922
January	49,162	16,088
February	55,560	20,869
March	71.598	34,074
April	75,851	40.474
May	*74,500	46,736
June	.....	48,541

* This preliminary figure includes Buick, Cadillac, Chevrolet, Oakland, Oldsmobile passenger and commercial cars and GMC trucks.

International to Continue Its Present Sales Policy

CHICAGO, June 6—No change in the sales policy of the International Harvester Co. of America is contemplated following the placing of H. K. Curll in charge of motor truck sales at the main office here, and the appointment of O. W. Browning at the head of truck sales at the New York branch of the company.

The main outlet for truck sales is through the ninety-three branches. Farm implement dealers handling the Harvester lines will continue handling trucks wherever equipped with service stations and other facilities to sell trucks.

The company will continue its policy of appointing exclusive truck dealers at certain selected points, where suitable dealers can be found.

Upon completion of the new truck factory at Fort Wayne, Ind., the company's plant at Akron will be devoted to the manufacture of axles and other truck parts.

Firestone Will Address Midwest Rubber Makers

CHICAGO, June 7—Harvey S. Firestone, president of the Firestone Tire & Rubber Co., is scheduled to be one of the speakers at the next meeting of the Midwest Rubber Manufacturers' Association, June 12, at the Hotel La Salle, Chicago. The board of directors will meet at 10 a. m. and luncheon will be served at noon, followed by speeches and discussion.

APPROVE FORD'S APPLICATION

WASHINGTON, June 6—The application of the Ford Motor Co. for power rights on the Mississippi River at St. Paul has been approved by all Federal agencies inclusive of the Federal Power Commission and final papers have been forwarded to Henry Ford.

Selden Revises List; Adds Another Model

New "Contractors' Special" Identical with 70-B Except for Its Engine

ROCHESTER, N. Y., June 6—Effective June 15, new prices will prevail on the trucks built by the Selden Truck Corp. On model 30-C 1½-ton, the price is increased $125, on the 53-B model 2½-ton, the price is $90 less, while on the 70-B 3½-ton, it is $425 above the former price. Both the 50-B 2½-ton and the 90 5-ton remain unchanged.

A new truck known as "Contractor's Special" and selling for $4,475 has been announced. It is identical with model 70-B 3½-ton, except that it is equipped with the engine used in the 5-ton chassis.

The price of the special bus chassis, unit 52, is listed at $4,850. The following are the latest prices:

	Old Price	New Price
30-C, 1½ ton	$2,250	$2,375
50-B, 2½ ton	3,250	3,250
53-B, 2½ ton	3,640	3,550
70-B, 3½ ton	3,750	4,175
73	....	4,475
90, 5 ton	4,950	4,950
52, Bus Chassis	....	4,850

Moon Increases Prices $100 on Complete Line

ST. LOUIS, June 2—The Moon Motor Car Co. has increased the prices of its cars $100. This affects all models on both the 6-40 and the 6-58 chassis and comes into force immediately.

The new prices are as follows:

6-40	
5-Pass. phaeton	$1,395
5-Pass. sport phaeton	1,595
4-Pass. coupe	1,685
5-Pass. sedan	1,795
5-Pass. sport sedan	1,995
6-58	
4-Pass. sport phaeton	$2,095
7-Pass. phaeton	1 885
7 Pass. sport phaeton	2,095
5-Pass. sedan	2,685
7-Pass. sedan	2,585
Limousine	2,785

HAYNES PHAETON LOWER

KOKOMO, IND., June 6—A reduction of $100, from $1,595 to $1,495, on the price of the standard model "57" five-passenger phaeton is announced by the Haynes Automobile Co., effective June 2. Quantity production due to increased demand is the reason assigned for the reduction.

REGISTRATIONS IN CAROLINA

COLUMBIA, S. C., June 6—South Carolina now has 15,042 more automobiles and 7928 more trucks than last year, according to figures announced by L. H. Thomas, secretary of the highway commission.

14.53 Per Cent Made on Capital in 1922

Moody's Statistics Place Manufacturing Investments at $1,802,408,000

NEW YORK, June 4—Capital invested in the motor vehicle manufacturing branch of the automotive industry has increased from $173,837,000 in 1909 to $1,802,408,000 in 1922, according to statistics compiled by John Moody and contained in the 1923 edition of Moody's Industrial Rating Book. A table showing the relation of the capital invested to the earnings, based on census figures from 1909 to 1919 and estimates for the latter years, follows:

Year	Capital Invested	Earnings to Capital
1909	$ 173.837,000	14.78%
1914	407,730,000	14.52
1919	1,310,451,000	21.87
1920	1,428,316,000	15.57
1921	1,454,048,000	4.91
1922	1,802,408,000	14.53

Moody contends that the aggregate national expenditure for motoring and motor transportation may be estimated roughly as follows:

New cars, trucks and parts at wholesale	$2,000,000,000
Paid to 120,000 dealers, garages and shops	1,500,000,000
Annual expenditure for gasoline	1,000,000,000
Tire and tube replacements	540,000,000
Aggregate licenses, fees, and taxes	350,000,000
Average annual road expenditures	300,000,000
Pay of 160.000 chauffeurs	240,000,000
Cost of automobile clothing, private garages	210,000,000
Lubricating oil at retail	110,000,000
Accessories, insurance and miscellaneous	750,000,000
	$7,000,000 000

It is explained that the second item includes the profits of dealers in passenger cars and trucks, and the last item many running expenses not specified elsewhere.

Moody estimates that the American people spend annually $2,850,000,000 for fuel and light; $2,400,000,000 for bread and foodstuffs; $4,500,000,000 for shelter; $5,500,000,000 for railroad transportation, and that the only items for which the nation spends more than for motor vehicles are clothing and meats.

The record, shown in the accompanying table, it is explained, is "from the best available sources." Average prices per car were generally obtained by dividing the value of the output by the number of cars. Net profits were estimated partly from census returns and partly from corporation reports. The 1919 census states the production of all classes of cars and trucks was 1,683,916, but "our figure was obtained by reducing the chassis, etc., to a whole car basis and adding them in." It is noticeable, Moody adds, that neither prices nor profits per car generally have any bearing upon the movement of the margin of profit.

Moody publishes a statistical record of production and use of automobiles in this country since the beginning of the industry, which was compiled by Leonard P. Ayres of the Cleveland Trust Co. One column in this table purports to show the number of cars eliminated each year. This estimate is based on the doubtful expedient of arbitrarily fixing the life of a car at five years and eliminating each year the number made in the fifth year preceding.

PEERLESS DISCUSSES CHANGE

CLEVELAND, June 4—Peerless directors at their meeting last week declared a dividend of $1 a share. The proposed plan of consolidating the Peerless Truck & Motor Co. with the Peerless Motor Co. was discussed, but no action was taken. Plans call for changing stock of $50 par to no par and of splitting up present stock and giving three shares for one

Durant Will Produce Eagle as Newest Car

Four and Six Cylinder Models Planned—Will Be Exhibited About Aug. 1

NEW YORK, June 4—Durant Motors, Inc., is announcing this week the Eagle four and six as the latest additions to its line. They will be manufactured in the plant at Flint which was built for the Star. The new cars will be shown for the first time about Aug. 1, and will be in production by the beginning of 1924.

Prices have not been definitely set, but it is understood that the four-cylinder line will compete with the Chevrolet, while the six-cylinder will be in a somewhat higher price class, although it will sell for considerably less than $1,000.

Few details about the Eagle are available. The chassis will be similar to that used for the Star with the Durant tubular backbone, and the wheelbase may be a trifle longer than on the Star. Especial attention will be given to the body lines and appointments.

No decision has been reached in regard to dealer representation, but it is possible an entirely separate sales organization may be formed.

6781 Cars and Trucks Built by Ford May 28

DETROIT, June 2—Ford Motor Co. went over 6700 a day for the first time May 28 when 6781 cars and trucks for domestic trade were built, exceeding the former high mark, May 21, by 123.

During the week ending May 29 a total of 39,563 were produced, an increase of 146 over the week before. In the same week tractor production totaled 1890 and Lincoln, 182.

Table Moody Gives as a "Record of the Industry"

Year	Value of Motor Output	Cars and Trucks Made	Price Each	Net Profits	Profits to Sales	Profits Per Car	Registration Dec. 31	Income of Amer. People.
1909	$165.148.529	127,731	$1,293.0	$25 697.000	15.56%	$201.2	294.000	$28,500,000,000
1910	225,000,000	187,000	1,203.0	27,518,500	12.23	147.1	472,700	31,400 000 000
1911	262,500,000	210,000	1,250.0	29,347,500	11.18	139.8	677,000	31 200,000,000
1912	378,000,000	378,000	1,000.0	39,123,000	10.35	103.5	1,010,399	33,000,000,000
1913	425,000,000	485,000	876.3	48,875,000	11.50	100.8	1,248,056	34,400.000 000
1914	458,957,843	569.045	806.6	59,205,600	12 90	104.0	1,768,953	33,200,000 000
1915	691,778,950	892,618	775 0	112,621,600	16.28	126.2	2,494,912	36.000,000,000
1916	954,969,353	1,583,617	602.9	158.238,500	16.57	100.0	3,584 567	45,400,000,000
1917	1,274,488,449	1,868,947	681.7	160,075,900	12.56	85.7	4,992,152	53,900.000,000
1918	1,236,106 917	1,153,637	1,071.0	159,210,600	12.81	138.0	6,105,974	61.000,000,000
1919	1,885,112,546	1,876,356	1,005.0	286.537,000	15.20	152.7	7,596,503	66.000,000,000
1920	2,031,644,600	2,007,554	1,012.0	222 272,200	10.94	110.7	9,206,510	65.500.000.000
1921	1,260,000,000	1,686,550	755.4	71,442,000	5.67	42.4	10,505 630	47,000,000 000
1922	1,558,567,000	2,527,000	616.8	218,199,400	*14.00	86.3	12,364,377	52,457,000,000

*Estimated.

Production of Tires Slowed Down in April

Shipments Likewise Declined—Inventories of Casings and Tubes Increased

NEW YORK, June 5—Production of pneumatic casings, inner tubes and solid tires declined in April, as compared with March, according to a compilation made by the Rubber Association of America for the Bureau of Foreign and Domestic Commerce.

In the same month shipments likewise fell off, and with the exception of solid tires there was an increase in inventories.

A comparative table of inventory, production and shipments, as reported by the association, is as follows:

PNEUMATIC CASINGS

1922—	No. Mfrs. Reporting	Inventory	Production	Shipments
Jan.	66	4,174,216	2,055,134	1,596,806
Feb.	66	4,691,329	2,084,308	1,562,365
Mar ...	63	5,183,286	2,645,790	2,073,963
April ...	65	5,464,336	2,401,187	2,086,651
May ...	65	5,523,095	2,721,503	2,639,273
June ...	64	5,042,147	2,838,890	3,133,260
July ...	63	4,834,106	2,476,636	2,695,095
Aug. ...	63	4,629,392	2,905,209	3,029,823
Sept. ...	64	4,612,037	2,504,744	2,502,106
Oct. ...	64	4,682,958	2,674,662	2,588,770
Nov. ...	62	4,964,976	2,733,134	2,379,708
Dec. ...	59	4,599,208	2,656,942	2,934,079
1923—				
Jan.	62	4,695,916	3,127,270	2,994,297
Feb.	60	5,224,387	3,217,987	2,588,659
Mar. ...	58	5,670,601	3,865,726	3,322,637
April ...	56	6,088,272	3,539,326	2,976,160

INNER TUBES

1922—	No. Mfrs. Reporting	Inventory	Production	Shipments
Jan.	66	5,246,647	2,343,393	1,889,724
Feb.	65	6,141,956	2,596,774	1,702,583
Mar. ...	63	6,991,118	3,017,511	2,090,737
April ...	65	7,230,096	2,650,573	2,329,343
May ...	65	7,189,552	2,970,696	2,938,947
June ...	64	6,186,543	3,130,629	3,973,679
July ...	63	5,675,839	3,068,199	3,630,744
Aug. ...	63	5,207,228	3,808,224	4,220,055
Sept. ...	64	5,164,757	3,501,442	3,558,971
Oct. ...	64	5,488,033	3,787,758	3,420,680
Nov. ...	61	6,210,053	3,850,908	3,075,023
Dec. ...	59	5,732,125	3,411,074	3,825,949
1923—				
Jan.	62	5,838,310	3,951,885	3,748,651
Feb.	60	6,771,958	4,039,202	3,001,697
Mar. ...	57	7,740,945	4,875,414	3,828,315
April ...	55	8,394,184	4,259,558	3,535,635

SOLID TIRES

1922—	No. Mfrs. Reporting	Inventory	Production	Shipments
Jan.	11	181,769	40,224	33,294
Feb.	11	183,448	39,492	36,805
Mar. ...	11	182,197	49,433	48,350
April ..	11	173,748	46,664	52,309
May ...	11	170,904	57,640	60,711
June ...	11	169,808	66,089	63,408
July ...	11	176,375	71,505	60,425
Aug. ...	11	189,698	84,313	69,435
Sept. ...	11	200,016	82,767	66,797
Oct. ...	11	213,942	85,480	71,275
Nov. ...	11	234,684	85,775	61,466
Dec. ...	10	244,061	77,221	64,570
1923—				
Jan.	11	262,462	83,343	60,611
Feb.	11	270,191	75,457	62,394
Mar. ...	11	265,843	79,788	77,144
April ...	11	260,631	71,468	72,609

"Production" and "Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.

"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouse, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.

"Shipments" includes only stock forwarded to a *purchaser* and does not include stock forwarded to a warehouse, branch, or on a consignment basis, or abroad.

TAXICAB ORDINANCE DRAFTED BY OWNERS

CHICAGO, June 4—A model ordinance for the regulation of taxicabs has been drafted by the National Association of Taxicab Owners which calls for the bonding and placing of liability insurance on each vehicle; the name of the company on the doors of the cab and the use of taximeters.

More than 600 copies of this ordinance have been sent out by the secretary of the association, 500 North Dearborn Street, Chicago, to city officials seeking information on this point of legislation.

American Racing Team Seeks Foreign Honors

INDIANAPOLIS, June 4—There will be an invasion of Europe by an American racing team this year, and Jimmie Murphy, national champion, will be on the team. This is made possible through the organization of the Miller special team, which will include Murphy, Martin de Alsaga and Count Zborowski, the last two named being Bugatti pilots who were strongly impressed with Miller's showing on Memorial Day. De Alsaga has bought two of the Millers, and the third was purchased by Zborowski.

The team will be managed by George H. Robertson, former holder of the Vanderbilt cup, who has lived abroad since the war. In addition to the three drivers named, Ernie Olson and Riley Brett, mechanics, will accompany the party. The first appearance will be in the 500-mile race on the Monza speedway in Italy, which is scheduled for Sept. 9.

Durant Built 1356 Cars in All Lines on May 31

NEW YORK, June 4—A new high water mark for Durant production was reached on May 31 when a total of 1356 cars in all lines was produced. The total for the month was 24,164, as compared with 21,194 for April, making a grand total of 148,542 since production was begun on the Durant lines. Production on closed models is being increased as rapidly as possible.

HENRY SPENCER DEAD

DETROIT, June 5—Henry Spencer, president of The Spencer Smith Machine Co. of Howell for many years, until succeeded recently by E. MacPherson Smith, died this week at Howell after an illness of several months.

Earl Funding Plan Goes to Creditors

Stockholders Have Agreed to Proposal for Refinancing National Motors

INDIANAPOLIS, June 4—A new plan for refinancing the National Motors Corp. is proposed in a letter to creditors sent out under date of May 31 by President Clarence A. Earl, which, it is hoped, will give the corporation five years of grace in which to put the business on a sound footing.

As outlined by Earl, arrangements have been made for the elimination and funding of items aggregating $5,103,100 which otherwise would have to be met during the next five years.

Waiver by Bondholders

This result was brought about by prevailing upon the holders of Series A and Series B bonds to waive for a period of five years the $500,000 yearly sinking fund provided for under the terms of the trust indentures by funding all interest coupons due on the collateral trust gold notes prior to July 1, 1925, the interest amounting to $637,500, by obtaining the cancellation of all existing agreements to repurchase an aggregate of $1,965,600 of collateral trust gold notes prior to their maturity.

This arrangement is contingent upon the creditors agreeing to cooperate as outlined, whereupon the corporation states that it can negotiate an underwriting contract for the sale of over 2 years of $10,000,000 of Series A no par common stock to be used only for a working capital. This is contingent, however, on the creditors accepting a new issue of not exceeding $3,000,000 of debenture notes to fall due in July, 1925, which could be used as a temporary medium of carrying the present general floating indebtedness of the company.

It also is suggested that $300,000 of the present inventories be transferred to a revolving fund corporation where the proceeds of this inventory, with $1,500,000 in cash from the sale of Series A common will be used as working capital.

Inventories to Be Pledged

Earl also proposes, with the consent of the senior security holders, to hypothecate and pledge the balance of the company's inventories, amounting to about $6,106,000 plus receivables of about $1,016,000, or a total of $7,122,000, to pay one year's interest on Series A bonds and one year's taxes upon the properties, a total of about $350,000 and to secure the $2,700,000 of collateral trust gold notes and the proposed new issue not exceeding $3,000,000 of debenture notes maturing in 1925.

In his statement Earl claims the corporation has total tangible assets of $18,609,861, which is two and a half times in excess of the total liabilities.

Men of the Industry and What They Are Doing

Lawrence Goes to Copenhagen

M. F. Lawrence, assistant to J. D. Mooney, vice-president of the General Motors Corp. and president of the General Motors Export Co., will sail from New York on June 9 for Copenhagen, Denmark. Lawrence will become assistant manager of the company's offices there. His assignment to that post follows Mooney's recent visit to Copenhagen, where he found conditions promising for the sale of motor vehicles. H. G. Zimmerman will continue as manager of the office.

Steward Directs White Advertising

Stanley P. Steward has succeeded M. H. Newton as advertising manager of the White Motor Co., Cleveland. Steward has been with the White company ten years, first as assistant advertising manager, then manager of the sales promotion department, and recently in charge of the American Railway Express Co. account. Newton will take up other work with the company. Milton W. Lusk has become manager of sales for the New Orleans district. He has been doing special work in the sales department at the factory, and has been handling the motor bus work.

International Promotes Curll

H. K. Curll, who has been engaged in special sales work for the International Harvester Co. of America at the main office in Chicago, has been placed in charge of motor truck sales. He has been with the Harvester company twenty years, having started as a salesman at the Pittsburgh branch. He served in executive capacities at other branches, and in 1918 was assigned to the Chicago office.

Remy Promotes Evans

R. K. Evans, formerly a sales engineer for the Remy Electric Co. of Anderson, Ind., has been appointed service manager to fill the vacancy made by the resignation of E. E. Eby. Eby will join the sales staff of the Hyatt Roller Bearing Co. at Newark, N. J., and will be assistant to Horace A. Brown, general sales manager. This move brings him back with his old associates, as he was connected with Hyatt a few years ago.

Changes with Kelly Tire

Through the resignation of John V. Mowe as vice-president, director and sales manager, caused by continued ill health, a number of changes in the administration personnel of the Kelly-Springfield Tire Co. have been made. Maurice Switzer, vice-president, will continue the supervision of sales and advertising, but W. H. Bell becomes sales manager in charge of branches and organization, and T. S. Lindsey sales manager in charge of branch and manufacturers' sales. H. R. Hurd, formerly assistant advertising manager, becomes advertising manager, with E. E. Hill as his assistant.

Cuddihy Takes Poag's Place

F. A. Cuddihy has been selected as manager of the research department of the Campbell-Ewald Co. of Detroit. Cuddihy succeeds E. J. Poag, who has joined the Buick Motor Co. of Flint. Cuddihy comes from the John L. Clough Advertising Agency of Indianapolis. The appointment accompanies the leasing of additional floor space of 1372 sq. ft. in the General Motors Building, making 9212 sq. ft. in all.

George Drake Smith Resigns

George Drake Smith has resigned as sales manager of the Steinmetz Electric Motor Car Corp., Baltimore. He will engage in the promotion and sale of investment securities, his temporary address to be 25 West Forty-third Street, New York City.

Sonneborn with Splitdorf

S. S. Sonneborn has joined the Splitdorf Electrical Co., with headquarters at the factory in Newark, N. J. Sonneborn, who has had thirty years' experience in his line, will take complete charge and supervision of molded parts of shellac, rubber and synthetic compositions for Splitdorf.

Adair Takes on More Duties

Herbert J. Adair, president of the Trexler Co. of America, has also assumed the general managership of the company. Adair long has been associated with the industry in manufacturing executive capacities, and from now on he will devote his personal attention to the sales end of his company.

Dalton Succeeds Burnell

L. M. Dalton has succeeded E. J. Burnell as manager of the Boston branch office of the Link-Belt Co. of Chicago. Burnell resigns his post to enter business for himself.

Hopkins with Spotlight Maker

Ross Hopkins, formerly in the wholesale division of the Klaxon Co., is now sales manager for Phal & Bitter Machine Co. of Toledo, manufacturer of windshield spotlights.

Neill in San Francisco

H. A. Neill, supervisor of branches of General Motors Truck Corp., has been appointed manager of the San Francisco branch, succeeding H. P. Smith, who died recently. He will have charge of the Pacific Coast territory as district manager.

Fred J. Wagner Dined by Club in New York

One Hundred and Fifty Old Timers Present—Alfred Reeves Presides

NEW YORK, June 5—The testimonial dinner given Fred J. Wagner, well-known race starter, last night at the Astor by the Motor Club of New York on the eve of his departure for California, which henceforth will be his home, was featured by the presence of United States Senator Royal S. Copeland, State Senator James Walker and Deputy Police Commissioner John A. Harriss, the man who evolved the tower system of traffic control in New York. Presided over by Alfred Reeves, general manager of the National Automobile Chamber of Commerce, the dinner was a strong testimonial of the popularity of "Wag," more than 150 old-timers of the industry attending.

The dinner was of more than ordinary significance because of the presence of the big politicians, which naturally led to a discussion of automobile laws, traffic control and good roads legislation. It was this talk that led Dr. Harriss to point out that New York's traffic system was so efficient that statistics show that in the last year there has not been a single fatality on Fifth Avenue.

The Commissioner also elaborated on his pet hobby of making Sixth Avenue the main artery of traffic by widening it to 300 ft. with four zones of travel, with fast traffic permitted to go 35 and 40 miles an hour. If this is done, the parking problem will be partially solved, he thinks, by utilizing basements and cellers under the widened portion on Sixth Avenue for parking spaces.

Rides Registration Hobby

State Senator Walker rode the old hobby of registration and examination of all drivers throughout the State and not in New York City alone, whereupon Reeves brought out that, while motorists would not object to a real examination, they thought the present system a farce. He also said that such registration fees should be good until revoked and not renewed annually in the nature of a revenue producer.

Another point made by Reeves was that last year motorists of New York State paid $11,000,000 in fees, of which $9,000,000 was spent in the maintenance of the highways, thus showing that motorists more than pay for what they get in the way of road upkeep.

Fred E. Moscovics of the Nordyke & Marmon Co. made the presentation speech when the Motor Club's gold watch was presented Wagner.

Gasoline Tax Helps Roads in 30 States

Great Increase Since 1921—Highway Expansion Predicted by Federal Bureau

WASHINGTON, June 8—Expansion of highway construction is predicted by the Bureau of Public Roads. The general outlook is considerably better than a year ago when the railroad and coal strikes were disturbing factors. Added to this is the fact that the designation of the system of Federal-aid highways is now complete in thirty-three States and practically complete in most of the others. With a definite program for accomplishment laid out, road work can proceed much more smoothly.

From latest reports it appears that thirty States now tax gasoline as compared with four States at the beginning of 1921. Most of the revenue derived goes for road purposes and bureau officials regard this as a step in the right direction.

Wages of labor are generally slightly higher than a year ago, with the exception of those on the Pacific Coast where the same rate prevails. The greatest increase is in New England where the present level is approximately 30 per cent higher than the level of a year ago.

Returns from twenty-one scattered States show that in those States there will be available $28,000,000 for road work as compared with $273,000,000 spent in the same States last year.

Gasoline Stocks Show Increase Over April

WASHINGTON, June 6—Increased demand for gasoline as the result of high production records in the automobile industry has resulted in increases in the output of gasoline.

Figures compiled by the Bureau of Mines show that the stock of gasoline on May 1 exceeded that of April by 77,000,000 gal. Gasoline output for the month amounted to 619,042,667 gal. Indicated consumption of gasoline in April reached 474,187,507 gal., an increase of 42,000,000 gal. over March.

Gasoline consumption has not increased however, at as rapid a rate proportionately since February of this year as it did in 1922.

Lee to Increase Capital for Purchase of Republic

NEW YORK, June 6—Following a meeting of the stockholders of the Lee Rubber & Tire Corp. when an increase in capital stock from 150,000 shares of no par value to 300,000 shares was authorized, and the purchase of the Republic Rubber Co. property approved, Chairman John J. Watson, Jr., issued the following statement:

The Lee Rubber & Tire Corp. will issue 65,000 shares of increased capital to acquire the assets of the Republic Rubber Co. The balance of the stock will remain in the treasury. There will be no minority interest of Republic Rubber Co. outstanding.

In acquiring the Republic Rubber Co., the Lee Rubber & Tire Corp. is acquiring a plant with approximately three times its own capacity for less than 50 per cent of the formerly outstanding stock of the Lee company. At the present time, Lee and Republic are each doing about the same volume of annual business, $6,000,000 annually.

In the past, Republic has done an annual business upward of $18,000,000, and the Lee plant is working at capacity. The combined plants are producing 3500 tires daily. Acquisition of the Republic Rubber Co. will add greatly to the asset value of the Lee stock.

Laredo, Tex., May Become Junction in Air Service

LAREDO, TEX., June 8—When plans now being considered are finally adopted, Laredo may be the meeting point for a through international aerial mail service between New York and Mexico City. It is stated that arrangements have been already made for a branch daily aerial mail service between a connection with the New York-San Francisco line and San Antonio.

In Mexico City the Empress Mexicana de Navigacion Aerea is negotiating with the Government of that country for a concession to carry the mails between the capital and Laredo, with stops at San Luis Potosi, Saltillo and Monterey. It is stated that this company will also transport passengers. R. T. Carranza is manager.

If the concession is obtained by the company and the service is placed in effect the aerial line that is to run to San Antonio will be extended to Laredo and international connection made here for handling through mails, it is stated.

Longer Month Keeps May Production Up

(*Continued from page* 1248)

Agricultural districts will offer not only the most fertile field for car sales in the next few months, but will take an increasing percentage of motor trucks. Encouraging reports come from cotton growing areas and in the Middle West the wheat growing sections are taking their place among the best prospective purchasers.

Truck builders are moving forward along steady lines, with much of their activity centered on the lighter model of vehicle and with bus chassis forming no inconsiderable part of their output.

"JAY WALKERS" TO BE FINED

NEWARK, N. J., June 5—The City Commission has passed an ordinance providing imposition of fines ranging from $2 to $25 upon pedestrians crossing street intersections diagonally.

Makers Seeking End to Open Car Apathy

Urge Special Sales Efforts—Closed Body Supply Factor in June Output

(*Continued from page* 1248)

with a possible reduction toward the end of the month for manufacturing reasons. Hudson-Essex will approximate its May totals, being well situated with regard to closed body supply. Maxwell-Chalmers and Paige-Jewett will approximate May totals. Reo, Olds, Rickenbacker and Oakland will operate on somewhat lower schedules than in May. Earl, Durant and Dort also will show a tapering off this month.

In the higher priced field production will continue at about the same level as in May, according to reports from Cadillac and Packard.

Part makers and material sources report that releases in June run at about the same figure as last month. The general situation among the parts makers is that their output is booked up practically solid throughout this month and well into July. These orders are regarded as being on a conservative basis, and lead to the conclusion on their part that car makers do not expect pronounced cuts in production until July at the earliest.

Releases on truck parts and material are on a par with May and in the case of the large builders especially, truck production will keep at about the same pace. There is some switching on models—from light to heavy or the reverse.

Among Cleveland Manufacturers

CLEVELAND, June 6.—Although the record made during the first quarter of the present year will not be maintained, Cleveland automobile manufacturers feel that there will be a good seasonal run the remainder of the year and they have laid their production plans accordingly.

Chandler and Cleveland, which belong to the same family so far as financial backing are concerned, produced 5000 cars in May, the Chandler plant contributing 3000 of the total and the Cleveland, 2000. May was the banner production month for the Chandler.

Directors of the Jordan Motor Car Co. have been advised that orders on hand will keep the company busy at the rate of 1000 cars a month for the next 60 days.

The F. B. Stearns Co., maker of the Stearns-Knight, enjoyed a better record in dollar and cents during May than it did in April. The company ran at capacity in both months. Manufacturing of parts in the new plant of the Stearns Company was started during the first week of June. Excavation for this plant, a two-story building, was started 90 days ago, and the structure is practically completed.

SALES CENTERS REPORT ON CONDITIONS

Birmingham

BIRMINGHAM, Ala., June 5—The demand for cars throughout the Birmingham district has fallen off considerably during the last month, although it is still good.

Sales are still being made, however, almost up to the average for the year. This is accounted for by the fact that dealers have a number of prospects who could not be served during the rush, and harder work on the part of the sales forces is producing almost the same results attained during the first four months of 1923.

The drop in the demand for cars is more or less expected, due to the usual summer exodus from the cities of the South, and also to heavy rains during the month. Some dealers are still unable to get sufficient cars to supply their trade.

The sale of open cars is at least in proportion to the sale of closed cars. No stocks of either have been accumulated by dealers.

The used car situation as a whole is serious.

Milwaukee

MILWAUKEE, June 5—More cars were delivered at retail in Milwaukee during May than ever before in the history of the industry, and sales for the month likewise established a new high water mark. Since June 1 business has shown no distinctive change in characteristics or volume, and with cars coming more freely from factories, the general opinion of dealers is that June will exceed even the remarkable May record.

Dealers as a rule are behind on deliveries of closed types. The main reason why open cars are relatively free in supply is that arrivals from factories since May 1 have been exceptionally heavy, owing to the opening of all-water freight routes from lower Great Lakes ports to Milwaukee.

Boston

BOSTON, June 5—Sales in this vicinity are holding up better than during the early part of May. Dealers still are behind on closed models, but open cars are coming in faster and dealers are delivering them with great regularity. Cancellations are not noticeable, those recorded coming mostly from northern New England where the use of the cars has been restricted by winter. Used cars have been showing an improvement in sales in the last few weeks.

Dallas

DALLAS, TEX., June 5—While there was a silght decrease in the number of sales in Dallas and practically all Texas during May when compared with that of April, dealers declared the falling off was negligible and that on the whole the business continued excellent.

Dealers say that June offers excellent prospects. The first of the many crops is moving. During the month a $25,000,000 grain crop will be on the market and a $10,000,000 fruit crop, a $5,0000,00 tomato crop and a $5,000,000 berry crop will have been disposed of. Too, $6,000,000 worth of potatoes and $5,000,000 worth of cantaloups will have been sold.

Kansas City

KANSAS CITY, MO., June 5—May proved a gratifyingly good month for most car dealers and distributors, although heavy rains in the district occasioned a falling off in sales toward the end of the month.

Some dealers point to a shortage in deliveries as a reason for the decline in business, and there have been complaints of slow freight movements. There is a general feeling that the decline in volume, which in fact is small, is temporary, and most dealers seem to have prospective business well in hand to justify hopes for a good June. The approach of harvest is a factor in the good outlook presented for future business.

Used car conditions are steady.

Atlanta

ATLANTA, June 5—According to distributors and dealers in Atlanta there has been no falling off in retail sales the past month, and general conditions over the southeastern territory give every promise that there will be no appreciable decline in sales in the immediate future.

The South is differently situated in this regard than other sections, due to the high cotton prices prevailing. Sales, therefore, are particularly good in the smaller towns and rural communities.

Open models are in such demand that lower and medium priced cars are difficult to secure where wanted immediately. Used car sales also are holding up well, and as a whole better than they have been in some time.

Cleveland

CLEVELAND, June 5—Retail sales of automobiles fell off during May as compared with April, the decline, on the whole, not being serious. The final week of the month saw a spurt in sales, bringing the volume of business in favorable comparison with the record made in April.

Inclement weather retarded sales during the first three weeks of May, summer conditions coming during the last week.

The statement is made that the peak for the year has been reached but that the volume of sales will continue at a rate that may be considered good.

Denver

DENVER, June 5—Retail sales for May averaged a fairly good gain over April and also over a year ago, with some dealers reporting as high as 25 and 30 per cent increases.

Reports of enlivened trade are also coming in from outside distributing territory with the gradual clearance of snow and the opening of roads to comfortable travel in mountainous sections. Distributors predict strong summer selling throughout territory.

Although some dealers say the used car trade is slow, others report that these cars are holding their own, with some advising of gains. Open and closed models are still running about an even average, with the open expected to take the lead when summer weather and mountain travel get into full swing. This lead, however, is predicted to hold for only a few months.

Pittsburgh

PITTSBURGH, June 5—Retail dealers have awakened to the fact that their used cars are not moving with any speed, that full cash buyers have dwindled and that there remain purchasers, largely prospective, wishing to make trades. In consequence, dealers have felt it best to turn down many sales where a trade is involved.

With these conditions at hand, new business shows a falling off from that of a week or so ago and a bigger decline from that of April.

Dealers seem to be particularly anxious to speed up deliveries on old orders and collect their money. Purchasers who have had orders in for two months and have not yet received their cars are grumbling at the loss of interest on the money they set aside to pay for the car orders.

Columbus

COLUMBUS, OHIO, June 5—The demand for new cars is not as active as it was two months ago, but the falling off is hardly 10 per cent. In other words, the demand is about what it was during the previous month with closed cars the best sellers.

In all cases closed cars are selling on delivery, while open models are proving a slight drag on the market.

Sales of used cars are not particularly good, although closed models in most instances are easily disposed of. Open models in the used car class are moving slowly, and many dealers have a larger supply than usual.

Farmers are buying somewhat better than last year, but conditions in farming communities are not yet normal and money is tight. Retail business is expected to go along without change for the coming month.

President Commends Road Development

Pays Tribute to Automobile for Part It Plays in National Unity

WASHINGTON, June 4—The Zero Milestone, the gift to the Government of the Robert E. Lee Highway Association, was dedicated today, with President Harding making the principal address. The Zero Milestone, located on the Mall, marks the point of start of the national system of highways and really is symbolical of the good roads movement in this country.

The President paid tribute to the automobile for revolutionizing highway systems and bringing about national unity. He pointed out that the rural life of the nation is showing the effects of greater transportation facilities which have been annihilating distances and costs and removing the disadvantages of remoteness and isolation.

Road System Becomes Definite

Thus far, the President said, the automobile has been an evolution so rapid that the highway has not kept pace with the vehicle, but despite all the difficulties encountered since the war, wonderful progress has been made in highway construction until now the interstate system of approximately 200,000 miles begins to assume definiteness.

It was the contention of the President that the public has come to realize with the growth of motor transport in the open country that a broad plan always must be kept in mind, aiming to make improved rural highways complementary to the railroads. He declared that the motor car and the highways tend to strengthen ties of mutual interest and interdependence which unite all sections.

He pointed out that the country has been dependent upon the development of internal highways because of the vast continental areas, but regretted that the development of rural roads as tributaries to railroads had not been as progressive as railroad expansion. He stated, however, that within two decades, marking the beginning of the motor age, the country's advance in this respect has been phenomenal, making it most fitting that a recognized center of the highway system should be set up.

No Coast-to-Coast Road

The President commended the efforts of various road organizations for the completion of the main trunk highways and deplored the fact that there is not at present a single road from coast to coast which can be used unimpeded throughout the year.

Roy D. Chapin, vice-president of the National Automobile Chamber of Commerce, speaking on behalf of the automotive industry, said:

"Billions will be expended on our roads in our lifetime that highway transport may serve us. Partly from economic but more largely from human reasons, we must all give pause and study this newly powerful agent of marching civilization."

J. Walter Drake, who took office as assistant Secretary of Commerce today, also spoke on the highway problem and its influence on national life.

Yellow Cab Expanding Its Foreign Service

CHICAGO, June 5—The Yellow Cab Manufacturing Co. is establishing a branch office in Buenos Aires which will be in charge of James Warner of Mexico City, according to Gordon Lee, manager of foreign and domestic sales. Twenty more cabs are being shipped to Mexico City, making thirty-seven for operation there. Other shipments are being made to Melbourne and Sidney, Australia, and Major Harry Yeagle is to sail soon to open up sales in Japan, China, Federated Malay States, Java and South Africa.

"We are going to put Yellow cabs all around the world," Lee said.

The present capacity of the Yellow cab factory is taxed to the limit with a production of 1000 cabs a month. Work is being rushed on a factory addition which will have 400,000 sq. ft. of floor space.

Part of this addition will be used for the manufacture of cabs, but a large section will be for the production of motor cabs by the Yellow Coach Manufacturing Co., a subsidiary of the Yellow Cab Manufacturing Co. Lee expects the exports of Yellow cabs this year to be about 10 per cent of the production.

Sales of Imported Cars Increased During March

WASHINGTON, June 2—Indications are that American sales of foreign automobiles are increasing. Statistics of imports compiled by the Bureau of Foreign and Domestic Commerce show that the value of the forty-seven automobiles and chassis imported in March, 1923, amounted to $88,136, as compared with seventeen automobiles and chassis valued at $42,025, imported in February.

The total value of the 400 automobiles and chassis imported during nine months in March, 1923, amounted to $653,630.

There were no assessments during February and March of the 90 per cent duty on re-imported American cars and trucks.

Favor International Traffic Regulations

Delegates at Road Congress, Held in Seville, Adopt Recommendations

SEVILLE, May 25 (*by mail*)—Seven hundred delegates, representing thirty-six nations, attended the fourth International Roads Congress in this city. American and British representation was the most prominent. Among the American delegates was Pyke Johnson of the National Automobile Chamber of Commerce. It has been decided that the next road congress shall be held in Italy in 1926.

The work of the congress was divided into two main sections, dealing respectively with road construction and with traffc regulations. Considerable attention was paid to concrete roads, which, while common in the United States, are very little employed in European countries, and as a result of the interchange of views, it appears likely that concrete construction will be extended to the Old World.

Lack of Uniformity Now

The congress passed resolutions in favor of national traffic laws for foot passengers, with clearly defined penalties for those breaking the laws. Present traffic laws, it was said, too often fail because of their lack of uniformity, and it is desirable that they be put on an international basis and be as simple and concise as possible.

Among the traffic recommendations were the placing of all slow-moving traffic against the sidewalk. Car lines should not be allowed in any streets or public squares carrying heavy traffic. Obstructions, such as electric light supports, should not be allowed on the parts of roads given over to traffic. Slow moving traffic should be forbidden in certain streets at certain hours. On public squares carrying a heavy amount of traffic bridges should be provided or special zones reserved for foot passengers.

One-way traffic was recommended to be adopted as extensively as possible, the tracing of a line down the center of the street was approved, and, where the road was sufficiently wide, refuges should be provided to divide the traffic into two distinct streams.

Table of Imports and Reimports of the Automotive Industry for March, 1923, and for Nine Months

	March, 1922		March, 1923		Nine Months Ending March 31 1922		1923	
IMPORTS	No.	Value	No.	Value	No.	Value	No.	Value
Automobiles and chassis (dutiable)	31	$77,286	47	$88,136	370	$607,289	400	$653 630
Other vehicles and parts for them	..	78,192	..	190,574	..	678,096	..	739 365
REIMPORTS								
Amount of duty collected	..	.....	..	.....	..	.....	..	(a)208,052
Automobiles (free of duty)	92	170,274	684	701,159	2,381	3,642,633	2,655	3,324,599

a—Beginning September, 1922.

Southeast Farmers Buy More Tractors

Outlook for Good Cotton Crop Is Also Expanding Market for Trucks

ATLANTA, June 6—Reports from the seven larger distributors of tractors and power farming machinery, covering the southeastern field, show an increase in sales during April of 14.4 per cent as compared with March, which is the more noticeable due to the fact that in March there was an increase of 45.4 per cent over February sales.

In other words, sales in April were almost 60 per cent better than in February, and more than 100 per cent better than they were in March, 1922. As compared with April, 1922, sales for April this year were 44.6 per cent greater.

Implement and tractor dealers advise that there is a great deal of business to be obtained from farmers this year in the southeastern field by those who go after it with the right sort of merchandising methods. The field is far from being covered, and there are hundreds of farmers all over the section who do not use tractors.

Due to the fact that last year's cotton crop netted them very large profits, that the present price is holding firm and this year's crop gives every promise of also netting a large profit, practically all southeastern farmers are now worthwhile prospects for tractor and power farming machinery sales.

While definite figures on May implement and tractor sales are not as yet available, the seven distributors making the above report state May business will be equally as large as April, and that indications promise it will hold up to this mark through the entire summer.

There is also an excellent potential market here for truck sales.

Detroit Newspapers Seek to Solve Traffic Problem

DETROIT, June 4—The traffic problem in Detroit has become such a serious one that two newspapers of the city, the *Detroit News* and the *Detroit Free Press*, are conducting front page campaigns—one seeking means for better regulation of traffic and the other offering free inspection service on brakes, wheels, steering gear, headlights and speedometer.

The police department is cooperating in both campaigns to the extent that the suggestions on traffic regulation received from *News* readers will be studied and all practicable suggestions adopted. In the *Free Press* campaign the police department will recognize the safety certificates issued by the inspection stations as official inspection tickets.

The free inspection plan is in anticipation of a vigorous drive by the police on all cars and trucks which give indications of faulty mechanism in the parts described. These will be ordered off the streets to police points where the parts will be given thorough tests. Cars found faulty will not be permitted to operate until they have been repaired.

Loss of life in the city in accidents in which automobiles figured has been heavy this year and is stimulating the police to extraordinary activity. To some extent traffic conditions and the numerous accidents are retarding sales, although the number of buyers thus influenced is insignificant as compared with the heavy list of purchasers of the year to date.

FINANCIAL NOTES

Moon Motor Car Co. in April earned $142,627, after all charges but Federal taxes, which is equivalent approximately to 95 cents a share on the 154,213 shares of no par common stock. For the four months ended April 30, earnings, before taxes, were $545,272, equivalent to approximately $3.50 a share.

Ford Motor Co. has announced an extra dividend of 5 per cent and the regular semi-annual dividend of 3 per cent on the investment certificates sold by the company to its employees. The dividend amounts to 8 per cent and covers the first six months of the current year.

Chandler Motor Car Co. reports that net earnings for the first five months of the year approximate $1,700,000, or more than a full year's dividend requirements at the current annual rate of $6 a share on the 280,000 shares of no par value capital stock outstanding.

Maxwell Motors Corp. announces that it has paid all of its $2,300,000 Series B outstanding notes. There now is outstanding only $4,300,000 of the Series C notes. The company has reduced its indebtedness by $8,000,000 during the last two years.

Jordan Motor Car Co. has declared a quarterly dividend of 1¾ per cent.

Salmson Two-Seated Car Wins French Road Race

PARIS, May 23 (*by mail*)—Piloting a couple of 67 cu. in. Salmson two-seater light cars, Desvaux and Benoist tied for first place in the French 24-hour road race with a total distance of 1104 miles, equivalent to 46 m.p.h. for the two rounds of the clock.

The race was held over a road course, about four miles to the lap, and both drivers remained at the wheel the entire twenty-four hours. Casse, driving a similar Salmson, finished third with a total of 1072 miles, the others in order of merit being Fratissier (Amilcar) 923 miles; Leblanc (Rally) 818 miles; Brault (Rally) 684 miles; Dayot (Defrance) 673 miles, Vassini (Defrance) 612 miles.

Senechal, driving a four-cylinder car of his own make in the 45 cu. in. class, covered 1039 miles, or an average of 43.2 m.p.h. Battagliola on a Benjamin was second with 894 miles, and another Benjamin covered 843 miles.

BANK CREDITS

Written exclusively for* AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.

The irregularity in business as a whole continues. Forward buying in general remains on a reduced scale, while industrial production in most lines proceeds more nearly at the high rate recently attained. A seasonal lull is apparent in some trades. Unfavorable weather has retarded spring retail trade, particularly in the South and West.

The Government estimate of the condition of the cotton crop as of May 25—71 per cent of normal, as compared with a ten-year average of 73.6 per cent and 69.6 per cent a year ago—was slightly more favorable than generally had been expected. There was nothing in the report, however, so early in the growing season, to produce any radical change in business sentiment as affected by the prospective yield of cotton.

The recession in commodity prices continues. Average wholesale prices, as measured by the Fisher copyrighted index, declined 1.8 per cent last week. This is the largest weekly recession since the decline began in the second week of April. This index now shows prices slightly below the mid-February level.

Freight Car Loadings High

Freight car loadings in the week ended May 19 set a new high record for the current year and were within 2.6 per cent of the high record for any week. The gain in the total over the preceding week was 17,266 cars, but loadings of merchandise and miscellaneous freight declined slightly.

Incomplete returns indicate railroad net earnings in April exceeding the March figure, although a seasonal decline is normally expected.

The halt in the expansion of construction activity is reflected principally, not in abandonment of work begun, but in postponement of work which had not reached the contract stage. Strikes have been an important factor in the local building situation.

Sales of principal mail order houses in May were 1,400,000 below the April figure, a favorable showing for the season.

Reserve Discounts Larger

Discounts by the Federal Reserve banks on May 29 were larger by $30,682,000 than on May 23. This compares with a gain of $93,743,000 in the week covering the preceding month-end. The net increase in discounts for the four weeks ended May 29 was only $655,000. Compared with last week's gain in discounted bills was the decline of $13,032,000 in bills purchased and $17,671,000 in holdings of Government securities. Deposits declined $34,694,000, while the Federal Reserve note circulation increased $22,517,000. The reserve ratio advanced from 75.6 to 76.1 per cent, which compares with 78.0 per cent a year ago.

Indianapolis Track Future in Balance

Opposition to Memorial Day as Time for Race Cause of Uncertainty

INDIANAPOLIS, June 4—All sorts of rumors are current as to the future of the Indianapolis speedway, following the statement that a meeting will be held soon, probably in Detroit, at which automobile manufacturers will be invited to attend and discuss the situation.

This unrest has been brought about through the condition of the track itself and the bitter fight put up by the American Legion to stop the running of the classic on Memorial Day. Although the Legion was beaten this year and the Governor vetoed the measure that would have prevented the holding of the race on May 30, it is expected that the fight will be renewed again next year with the possibility that the veterans may win out. Any other day for the race is out of the question, in the minds of the promoters, and it is thought that if May 30 has to be given up the race will be abandoned.

All this will be gone over at the meeting which also will discuss whether or not it would be advisable to spend something like $200,000 to put the track into condition. The bricks show wear and if the race is to continue it is certain that a big amount of money must be spent to put it into shape.

Regardless of what the meeting does, the gossip here is that Carl G. Fisher is ready to step out of the racing picture. His other interests have weaned him away from the sport and he knows that Memorial Day will be the bone of contention yearly with the Legion and Fisher does not relish it. It is certain that he will not move the speedway to some other city as has been intimated and there seems to be some truth in the rumor that the track is on the market and likely to be sold to new interests.

Stutz Plans to Wage Advertising Campaign

INDIANAPOLIS, June 6—The Stutz three-day convention last week brought together 157 distributors, dealers, sales and service men. Additional orders for a quarter of a million dollars worth of cars were signed and distributors and dealers agreed to a large dealer-factory advertising campaign to be conducted in newspapers throughout the country.

Charles M. Schwab, making the principal address at the dinner in connection with the convention, reiterated his intention of getting behind the company and developing it to the utmost.

COTTON CONTROL PASSES

AKRON, June 5—The Southwest Cotton Co., a subsidiary of the Goodyear Tire & Rubber Co., has closed a deal under which it retains only the gins of its Goodyear and Litchfield ranches, thus retiring from the controlling position it held in the cotton industry of the Salt River Valley, Ariz. Control passes to the Mutual Cotton & Oil Co. of Phoenix.

The Southwest company retains about 20,000 acres of land and will continue to raise long staple cotton for tire manufacture.

INDUSTRIAL NOTES

Surplus Steel Exchange of 7 Dey Street, New York City, has been formed for the purpose of presenting an outlet for surplus stock material which will be listed free of charge. A commission will be charged only on sales actually made, as the exchange will not purchase material, acting only as agent. The officers of the new company are: Robert D. McCarter, president; George E. Dix, vice-president; William L. Cooper, treasurer, and Edward Michaud, secretary and general manager.

Perfection Battery & Light Co. has been organized in Atlanta, succeeding the Perfection Battery Manufacturing Corp. of Chicago, and has established a plant in that city for the manufacture of batteries, farm lighting equipment and replacement parts for garages and service stations. C. V. Jones, formerly president of the Eagle Picher Lead Co., heads the new company as president.

White Co., sales subsidiary of the White Motor Co., has moved its foreign department from New York to Cleveland, and the name has been changed to the export department. Jay Rathbun is moving to Cleveland as manager of the department.

Peugeot Makes Agreement for All Metal Airplanes

PARIS, May 28 (*by mail*)—All metal airplanes equipped with heavy oil engines are promised by the Peugeot Automobile Co. as the result of an agreement between that firm and the Société d'Emboutissage & Construction Mécanique of Colombes, near Paris.

The planes will be equipped with 500 hp. two-stroke engines built by the Peugeot company under Tartrais patents, which are guaranteed to start on kerosene and run with any kind of heavy oil. Peugeot has had this type of engine in service on trucks for more than a year and a few months ago applied it to passenger cars for Colonial service. By the use of this engine the danger of fire is practically eliminated.

The airplane company working in conjunction with Peugeot became prominent during the war as a big producer of various types of army machines, and since then has specialized in all metal airplane construction.

90 PER CENT CLOSED CARS

SYRACUSE, June 5—The Franklin Automobile Co. reports that over 90 per cent of the May shipments were closed cars, which, it believes, is a record for closed car production among automobile manufacturers.

METAL MARKETS

The attitude of steel mill purchasing agents toward the market for their own raw materials is entitled to some consideration in an appraisal of the steel market's future. In the coke market it is understood that the leading independent steel interest has deferred covering its third quarter requirements until the contract price for that delivery period is more in line with its ideas as to price. Buying of scrap by steel mills has come to a halt for the time being.

While the purchasing agents of steel mills, even in times when their raw material needs are obvious, frequently have resort to apathy toward offerings as a strategic protection against rising markets, they are unquestionably displaying at this time pronounced conservatism. This sentiment reflects what is coming to be the attitude of consumers toward the steel market more and more from day to day. The forthcoming unfilled tonnage statement of the leading interest is eagerly awaited by those who are certain that it will disclose the maintenance of heavy demand.

No matter what the figures are, there will be those who will interpret them as denoting uninterrupted buying of steel. The manysidedness of the steel industry's outlets tends frequently to obscure the real meaning of the unfilled tonnage reports. Within the last few weeks there have been reports of heavy buying of rails. Rail mills are a division of the steel industry, standing, however, distinctly apart from the others. Buying of rails under normal conditions does not denote commensurate industrial activity at the time of placing the orders which are usually for deferred delivery periods.

A favorable effect on the unfilled tonnage statement by the placing of orders for rails must be discounted, therefore, when the statement is used as a barometer for gaging the strictly industrial demand for steel. On the basis of the leading producer's sheet prices, there is slightly more interest in third-quarter offerings. Chief interest, however, continues to be shown by automotive consumers in securing deliveries of sheets due them on old contracts. Cold-drawn steel bars are in lessened demand, and several producers are reaching the end of their backlog of orders.

Pig Iron.—Automotive foundries are still out of the market, although some interests are apparently disposed to contract for moderate third-quarter tonnages when the foundry market reaches $28, Valley, a price level that is looked for to result from the present deadlock. A Port Huron foundry is reported to be sounding the market preparatory to contracting for 3000 to 4000 tons for third quarter.

Aluminum.—The stationary character of the virgin metal market continues, all incentive to price changes lacking. The domestic producer continues to have a comfortable quota of sheet orders on its books, and importers have virtually disposed of such tonnages as they are able to obtain from abroad. Fresh buying, as in other markets, is absent. The scrap and remelted markets are easier.

Copper.—Slowly but surely consumers are beginning to realize that copper is a "buy" at present prices, and somewhat more interest is being shown. Producers are not over eager to sell heavy tonnages at present levels which are chiefly the result of the dislocation of European markets, aggravated by intense competition in export business between the Copper Export Association and the leading independent copper marketer.

Calendar

SHOWS

Sept. 1-7 — Chicago, National Transportation Exhibition, under the auspices of Motor Truck Industries, Coliseum and Annex.

Nov. 4-10 — New York, First Automobile Exposition of the Foreign Automotive Association, Hotel Astor.

FOREIGN SHOWS

Oct. 4 - 14 — Paris, Passenger Cars, Bicycles, Motorcycles and Accessories, Grand Palais.

Oct. 15-20—London, Motorcycle Show, Olympia.

Oct. 24-Nov. 2—Paris, Trucks, Agricultural Tractors, etc., Grand Palais.

Nov. 1-15—Buenos Aires, Annual Automobile Exposition, under the direction of the Automovil Club Argentino.

Nov. 2-10—London, Automobile Show, Olympia.

Nov. 22-Dec. 1—London, Motor Transport Exhibition.

RACES

July 2 — Tours, French Grand Prix 500-mile race.

Sept. 3—Annual Pikes Peak Hill Climb.

Oct. 28—Barcelona, Spain, Grand Prix for vehicles of 1500 c.c.; Nov. 1, International Grand Prix for cycle cars of 1100—Nov. 4, International Grand Prix for two liter.

CONVENTIONS

June 26 - 27 — Detroit, Annual Convention of Automobile Body Builders Association.

Oct. 24-26—Cleveland, Thirtieth Annual Convention of the National Association of Farm Equipment Manufacturers, Hotel Statler.

Nov. 12-17 — Chicago, Annual Business Exhibit and Convention of the Automotive Equipment Association, Coliseum.

S. A. E. MEETINGS

June 19-23—Summer Meeting of the S. A. E.—Spring Lake, N. J.

Oct. 25-26—Production Meeting of the S. A. E.—Cleveland.

Jan. 1924—Annual Meeting of the S. A. E.—Detroit.

MEETINGS

June 14 - 15 — Bethlehem, Pa., Eastern Sectional Meeting of the American Society for Steel Treating, Hotel Reservations made through George C. Lilly, Superintendent of Heat Treatment, Bethlehem Steel Co., Bethlehem.

June 25-July 1—Dixville Notch, N. H., Summer Meeting of the Automotive Equipment Association.

Germany Makes Pact for European Trade

NEW YORK, June 5—Indications that special trade agreements, relating to automobiles, exist between the German government and the governments of Italy and Austria is given in information received here from Europe.

It is understood that these agreements affect in a general way the development of automotive foreign commerce in Germany, Austria and Italy. It is said that treaties and diplomatic obligations prevent any action by the American Government in instances where the trade agreements may exercise a harmful effect upon commerce of the United States.

Reciprocity a Feature

The large imports of cars from Austria to Germany is the result of a trade of the Austro-Daimler Co. and the Steyr Co., under which the German government issues licenses for the importation on condition that the Austrian automobile manufacturers buy certain parts of their automobile equipment.

According to information available, the number of licenses are regulated by the quantity of raw materials or finished products purchased in Germany by the particular Austrian manufacturers doing export business with the latter country. It is said that the Daimler licenses exceeded 300 in 1922, while the Steyr company exported 250 automobiles and trucks.

The story is current in many quarters in Germany that the Italian government, or at least Italian manufacturers, have an arrangement with the German authorities establishing reciprocity, whereby the Fiat car shipments are regulated by the number of German cars entering Italy. The quotations in lire in Italy and the prevailing rate for the mark have improved the business of the Fiat company.

Talks with representatives of American automotive manufacturers who have visited Germany show that they have little intention of cultivating the German market because of the handicap provided in the licensing system. Only sixty-nine automobiles were exported in 1922 to the United States, and six American cars were imported. The Ford and two moderate priced cars were popular there prior to the war. According to information received from reliable sources, the Benz Co. now has a distributor in America and Mercedes hopes to increase its American sales organization and dispose of several hundred cars of German make while the demand is in excess of American domestic production.

Citroen Charges Berliet With Having His Drawings

PARIS, May 28 (*by mail*)—On a complaint lodged by André Citroen, the Paris Court has ordered a judicial inquiry against the Berliet Automobile Co. of Lyons. Citroen claims that the Berliet company obtained illegal possession of the drawings and manufacturing methods of one of his new models. The court has ordered the seizure of a number of documents and drawings at the Paris and Lyons factories of the Berliet company, and an expert has been nominated to examine them.

It is maintained that the drawings were obtained through a former engineer of the Citroen company, who, according to a recent French law, can be held jointly responsible with the firm having received the drawings.

BARBOT USES GLIDER HERE

NEW YORK, June 5—Georges Barbot of France, now in this country, has made two flights with his glider, which is equipped with a small engine and for which great fuel economy is claimed. He flew from New York to Tarrytown and back Sunday, and yesterday traveled from Garden City, L. I., to West Point and return, a distance of 125 miles, using about two gallons of gasoline.

Hoover Will Conduct Distribution Survey

WASHINGTON, June 4 — Studies looking to economy in distribution of goods and elimination of waste in transportation will be begun actively by the Department of Commerce on July 1, when an appropriation of $50,000 for these purposes becomes available.

While the fund is limited and is only one-half of that sought from Congress by Secretary Hoover, it is hoped to develop constructive results from the work. The phase relating to economy in distribution will be brought about by setting up a division that will go into retailing as it affects the entire national life.

The work will be entirely new to the Department of Commerce. Although, as pointed out by Secretary Hoover, the original organic act of the department contemplated a bureau for certain services in the matter of domestic commerce there never before has been a provision of appropriation for work of that kind.

Distribution Big Problem

It is the attitude of Secretary Hoover that the greatest fault and deficiency in the economic fabric of the nation lies not in problems of production so much as it lies in problems of distribution. In seeking the appropriation he told a subcommittee of the Senate Committee on Appropriations that "we have not here in the Government any constructive study and thought on these problems."

It is proposed to establish a chief, an expert in these problems, with an assistant and agents in Washington to study the different problems involved. It will be an extension of the activities of the Bureau of Foreign and Domestic Commerce.

The study as to retailing will cover distribution and associated questions, together with an intensifying of the work of determining specifications of various kinds of goods.